SD-16

COMMUNICATING REQUIREMENTS

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IN REPLY
REFER TO

FOREWORD

A key element in successful acquisition is clear communication of requirements among the government and industry personnel involved in the acquisition. From the user's initial statement of need, to the final system specification, every step should be characterized by clear, performance-based statements of the requirements. These requirements are documented in a series of interlocking documents. This handbook describes these documents and shows the interrelationships between them.

The information in this handbook is applicable to all types of materiel and automated information systems and to all acquisition strategies. However, the handbook does not offer a single approach to communicating requirements—such an approach could not accommodate the vast, widely varying, array of potential materiel acquisitions. It does offer points for members of the acquisition workforce to consider as they shape their approach to communicating requirements.

The examples provided do not offer definitive solutions. They are intended to provoke thought, to give the reader insight, and to point toward innovative solutions to individual problems. Each program is unique. It follows that solutions, too, are unique. We must be careful not to rely too heavily on examples lest we create more problems than we solve. Use them as thought starters, but develop your own solutions tailored to your specific requirements.

Recommendations on improving the content of this handbook are welcome. Please send comments to:

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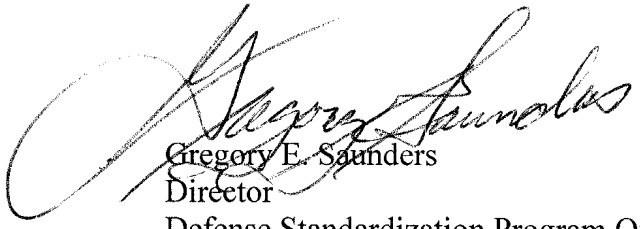

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COMMUNICATING REQUIREMENTS

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PURPOSE

The Defense Acquisition Deskbook, updated quarterly on CD-ROM, is the most current and comprehensive source of additional information.

This document discusses the key government requirements documents used by the Department of Defense (DoD) in the acquisition process. Its purpose is to promote a consistent approach to stating these requirements. This information is applicable to all types of materiel and services: systems, subsystems, assemblies, parts, and components.

In DoD acquisition there are two basic meanings of the term "requirement." An operational requirement is a need for a capability to solve a problem or satisfy an objective. This requirement relates directly to the user's needs in carrying out the mission. It is generally written in the user's language and describes the mission, the operations that need to be performed, and the capabilities needed to perform them.

A technical requirement is a translation of the user's requirement into terms that characterize the need technically, or contractually. These terms are essentially preconditions for acceptance. They lay out for the acquisition community and industry what minimum capabilities a product or service must have to be acceptable.

Requirements are generated in many different ways throughout the acquisition process. These stated and derived requirements are interrelated and interdependent and must be traceable to the original basic requirement, usually expressed in a Mission Need Statement (MNS).

This document is not intended to be totally comprehensive, either in the number of requirements that are addressed, or in the depth to which each requirement is examined. Appendix F provides a list of further references for additional information about requirements and current acquisition law and policy.

PERFORMANCE REQUIREMENTS

The set of military specifications and standards that can be used without a waiver from the MDA is limited.

Current DoD policy is to move to greater use of requirements stated in performance terms. Performance requirements leave out unnecessary "how to" or "what to" details and allow latitude on how to best meet the need. The purpose of the policy is to provide for innovative solutions to the user's need by not unnecessarily limiting the solution set. Performance requirements also increase the Defense Department's access to commercial, state-of-the-art technology and the existing commercial industrial base. The overall intent is to integrate military and commercial industrial production bases, reduce costs, and increase access to commercial technology.

The originating requirement must be stated in performance terms to allow the requirement documents that follow, further defining the requirement, to be written in performance terms. A performance-based approach should also apply to plans developed by government or industry, sections of requests for proposals, and resultant contracts.

A performance specification is stated in terms of the required results and provides criteria for verifying compliance, but it does not state methods for achieving results. It defines the functional requirements for the product, the environment in which it must operate, and its interface and interchangeabillity requirements.

DoDD 5000.1, *Defense Acquisition*, now requires that performance specifications be used when purchasing new systems, major modifications to existing systems, and commercial and nondevelopmental items. Performance specifications include commercial item descriptions, performance-based nongovernment standards, and DoD performance specifications. In the unusual case where a detailed military requirement must be established, use of a military detail (design) specification is authorized as a last resort, with an appropriate waiver or exception from the Milestone Decision Authority (MDA).

Statements of work, which describe the tasks that contractors will perform in terms of required outcomes or results, are also to be performance based. In addition to achieving the goals discussed previously, accountability for the final product is more clearly drawn. Contractors are responsible for achieving the required results based upon the technical and management approach that they propose. Contractors thus have greater flexibility but assume a commensurately greater risk share for contract performance.

Statements of work and specifications are discussed in detail in Chapter 3.

TYPES OF ACQUISITION REQUIREMENTS

Beginning with the ORD, market research is an essential part of the requirements development process. SD-5, *Market Research*, discusses this topic in detail.

Requirements can be categorized in many ways. One way is to break them down by their general purpose. First, some requirements begin with the fundamental user's requirements—the Mission Need Statement and the Operational Requirements Document (ORD).

Secondly, the acquisition process itself generates some requirements. They are generally thought of as programmatic requirements. Statutory, regulatory, and policy applications also influence potential solutions to a need. These applications include budgetary constraints, schedule requirements and constraints (like testing with other systems), as well as policy objectives such as acquisition through competitive processes, and retaining the ability to compete further spare parts requirements ("break out").

Thirdly, requirements are generated by the materiel developer to translate the user's requirement into performance specifications and allocate responsibility for fulfilling the requirements to various contracts. Examples of this category are the statement of work and military specifications. Finally, the contractor in defining and refining the proposed solution generates requirements. These requirements are directly linked to the system's higher level requirements that are documented in the ORD and MNS. They are found in documents like system specifications, product specifications, and test plans.

Types of Requirements

- User
- Programmatic
- Contractual
- Contractor generated

Chapter 2 addresses the first two categories of requirements—user and programmatic requirements. Chapter 3 addresses contractual and contractor-generated requirements. Chapter 4 discusses how the requirements process works in the context of each of the types of requirements. Finally, Chapter 5 addresses the evolution of requirements as a program moves through the acquisition life cycle. The appendices provide examples of some requirements—examples to give the reader an idea of what a particular requirement might look like. These examples are <u>not</u> intended as model requirements.

THE PATH TO DEVELOPMENT IS PAVED WITH GOOD INTENTIONS

or

A LITTLE REQUIREMENT CAN GO A LONG WAY

Consider the following scenario:

A Mission Needs Statement identifies the need for a deep strike capability to counter evolving threats. Changes to doctrine, tactics and training will not solve the deficiency.

The user community is concerned with the proliferation of vehicles in the field because of the increased maintenance burden, parts proliferation, and training requirements. The users want to make maximum use of existing vehicles.

So, in the draft of the initial ORD, The following statement is inserted:

the developer must use an existing vehicle.

The developer researches the existing fleet and decides that only one existing vehicle could possibly meet the need. Because of the vehicle's limited capacity a maximum of two missiles is decided to be the best alternative.

What are the repercussions of this decision?

- The length of the missile is restricted by the dimensions of the vehicle.
- The required Probability of Kill (PK) necessitates that two missiles be targeted to achieve the PK.
- Existing propulsion chemistry and warhead physics cannot meet the requirements.
- A costly R&D effort in developing new propulsion system and new warhead.

The user had a legitimate concern; however, translating that concern into a simple and logical logistical requirement drove the process to an expensive design solution.

Consideration of possible alternatives—remotely piloted vehicles, airborne lasers, satellites, high energy weapons, kinetic kill weapons—was eliminated.

Chapter 2:

User and Programmatic Requirements

USER REQUIREMENTS

MISSION NEED STATEMENT

There are essentially four steps in establishing an initial requirement. The Mission Need Statement (MNS) must be discussed in the context of these steps:

- Definition—translation of a deficiency into a mission need.
- Documentation—preparation of the Mission Need Statement.
- Validation—formal review of the MNS by an operational authority other than the user. This review confirms that non-materiel solutions are not available and assesses joint service potential.
- Approval—by the appropriate Milestone Decision Authority, except for an Acquisition Category (ACAT) ID program, which is approved by the Joint Requirements Oversight Council (JROC).

Validation and approval of the need is split, based on the ACAT. ACAT ID Mission Need Statements are submitted to the MDA who will validate and approve them. Approval of the MNS is merely a validation that the need is current and valid. It does not automatically initiate a procurement program. Approval and validation are not conducted by the using command or activity.

DoD policy is to try to satisfy mission needs through non-materiel solutions, such as changes in doctrine or tactics, or training. If a non-materiel solution will not satisfy the mission need, a team is formed to determine whether a materiel solution could satisfy the need.

The user documents deficiencies in current capabilities and opportunities to provide new capabilities in a materiel Mission Need Statement expressed in broad operational terms. The Mission Need Statement:

- Identifies and describes the mission deficiency; discusses the results of mission area analysis.

- Describes why non-materiel changes are not adequate to correct the deficiency.

- Identifies potential materiel alternatives.

- Describes any key boundary conditions and operational environments that may impact satisfying the need (such as information warfare).

The Mission Need Statement is prepared in accordance with Chairman of the Joint Chiefs of Staff Instruction 3170.01, *Requirements Generation System*. System performance objectives and thresholds are developed from, and remain consistent with, the initial broad statements of operational capability. The requirements are refined at successive milestone decision points, as a consequence of cost/schedule/performance trade-offs during each phase of the acquisition process.

What Is It?

Policy requires a continuing review of mission areas and technological breakthroughs. This review compares mission expected military capability in a particular area to the expected threat. It identifies deficiencies in capability or opportunities to exploit a weakness in the threat. Areas that are reviewed include:

- National security policy
- National military strategy
- Defense planning guidance
- Projected threats
- Exploitations of technological breakthroughs

The deficiencies or opportunities identified in these areas are called mission needs. The DoD components document deficiencies in their current capabilities and identify opportunities to provide new capabilities. These are then expressed in **broad operational terms** in the Mission Need Statement. This document identifies and describes the mission deficiency; discusses the results of mission area analysis; describes why non-materiel changes (i.e., doctrine and tactics, training, and force structure) are not adequate to correct the deficiency; identifies potential materiel alternatives; and describes any key boundary conditions and operational environments that may affect satisfying the need (such as information warfare). Functionally, the Mission Need Statement precedes the Operational Requirements

Document, which expands the Mission Need Statement using performance requirements.

Who Prepares It?

Typical preparing activities are:

- Component commands
- Joint Staff
- Services
- Commanders-in-Chief (CINCs)
- JROC

For Whom Is It Written?

The Mission Need Statement is written for the decision authority who will decide how best to address the deficiency. It is indirectly written for the individuals and organizations that will provide the materiel solution.

What Are The Inputs?

Identification of deficiencies and opportunities is a continuing process. It normally begins with a review of the current national security policy, national military strategy, defense planning guidance, and projected threats. This process is depicted in Figure 2-1, *Mission Area Analysis Process*.

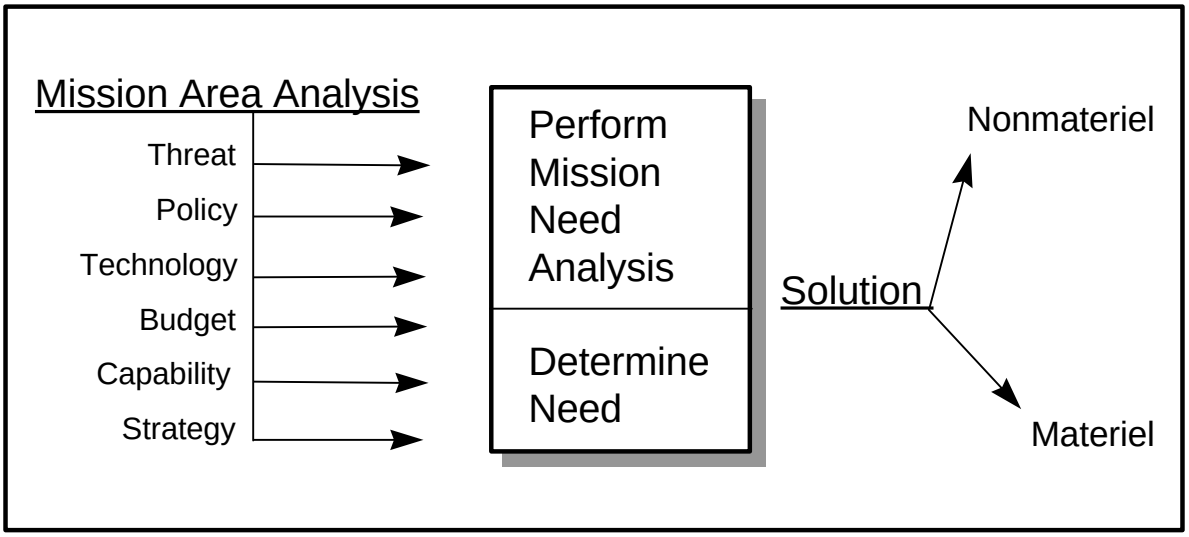


Figure 2-1 Mission Area Analysis Process

What Is It Used For?

The Mission Need Statement is the initial statement of a broad deficiency. Once it is approved, it may evolve into one or more Operational Requirements Documents that define system or performance parameters that will correct the deficiency. Joint service applications and commercial opportunities are evaluated during this process.

Does It Establish or State Requirements?

This question is not really germane. The Mission Need Statement establishes a deficiency. No actual requirement exists until the decision process determines that the deficiency must be corrected.

Variations?

None.

OPERATIONAL REQUIREMENTS DOCUMENT

What Is It?

As part of the evolutionary requirements process that begins with the mission need, the user or user's representative identifies operational parameters by applying the results of cost, schedule, and performance tradeoffs made during the concept exploration phase of the acquisition process. These parameters are the operational requirements that characterize the most promising concept (or concepts) to be pursued in the next phase of an acquisition program approved at Milestone I. They are documented in the Operational Requirements Document (ORD) by the user's representative—normally a military service or a service component of a combatant command.

An ORD translates the Mission Need Statement into more detailed and refined performance capabilities and characteristics. This description then becomes part of the acquisition baseline for the procurement. It influences the determination of the acquisition strategy.

The ORD provides a bridge that links the MNS to the acquisition program baseline and the contract specifications. Its guidance is intended to help program managers develop and document sound acquisition strategies. At each milestone, beginning with program initiation, the user documents thresholds and objectives (initially expressed as measures of effectiveness or performance and minimum

acceptable requirements for the proposed concept or system) in the ORD. Thresholds and objectives in the ORD consider the results of the analysis of alternatives and the impact of affordability constraints as the project progresses.

Who Prepares It?

The user activity's representative—the appropriate military service or DoD agency, prepares the ORD. At each milestone, beginning with Milestone I, the ORD must be validated and approved by the appropriate authorities. Validation confirms that the capabilities provided by the proposed concept and system will fulfill the mission need. It also confirms that there is no materiel alternative (including materiel from another service or allied system) which will meet the need with little or no modification. **Approval constitutes formal sanction and certification of the requirements document**. Approval authority resides with the chief of the service or as delegated. As part of the validation process, the user activity's representative coordinates the ORD with the CINCs and the affected services and defense agencies.

Validation of Command, Control, Communication and Computers (C^4I) ORDs must include a Joint Staff J-6 and Defense Intelligence Agency certification of C^4I interoperability considerations. For ACAT I programs, the MNS sponsor may provide the MDA with a recommendation for ORD validation and approval authority. The Joint Requirements Oversight Council will designate the validation and approval authorities for these programs. For some ACAT I programs, the Council may retain approval authority or designate this function to a service or CINC (e.g., USCINCSPACE). The approval authority submits approved ORDs to the appropriate MDA for action.

For Whom Is It Written?

The materiel development and test communities use the ORD as the foundation for the Acquisition Program Baseline and for the evolution of technical and contract requirements.

What Are The Inputs?

The primary basis for the ORD is the Mission Need Statement. Depending on the phase, the ORD may be updated by analysis of alternatives, market research, or other activities that give increased insight into the program as it matures. Figure 5-1, *Requirements Evolution*, displays the ORD requirements relationships.

What Is It Used For?

The ORD communicates the user's requirement to the materiel developer and, indirectly, to industry.

Does It Establish or State Requirements?

Absolutely. The ORD includes the definition of critical system characteristics. Critical system characteristics are those features that determine how well the proposed concept or system will function in its intended operational environment. They generally deal with properties that tend to constrain the design (e.g., hardening for survivability, dimensional or weight limits, power compatibility, etc.) Selected critical system characteristics in the ORD may be included in the Acquisition Program Baseline as key performance parameters (KPPs) although a critical system characteristic does not have to be a key performance parameter. The JROC will review the proposed final list of critical system characteristics for ACAT ID programs before Milestone II. The ORD validation authority should accomplish this review for ACAT IC, II, III, and IV programs.

The wording in Section 2.3 and Appendix II of DoD 5000.2-R supports the importance of avoiding early commitment to a system specific solution and avoiding a solution that will inhibit future insertion of commercial off the shelf components or equipment.

Variations?

The only variations are in the approval process, which is dependent on the ACAT classification of the potential solution set.

FUNCTIONAL DESCRIPTION

What Is It?

The functional description defines the basic operational requirements for a system's automated capabilities. It is a follow-on to the ORD to specifically address requirements related to information technology. It is intended to provide a clear, unambiguous description of the proposed system's information technology requirements before starting system design. The user's representative writes it.

Who Prepares It?

The user's representative writes the functional description in coordination with the materiel developer. The industrial base

participates through the market survey process. The user's representative approves the functional description.

For Whom Is It Written?

Members of the acquisition workforce associated with the project and those elements of the industrial base who will be responding to the solicitation use the functional description. If a functional description is prepared, it may provide input to the materiel developer's information technology system documentation.

What Are The Inputs?

Primary inputs come from the Acquisition Strategy, the Acquisition Program Baseline, the Operational Requirements Document, market research, laboratory experimentation, and original thinking from the project team. Other information sources include the System Decision Paper, the Mission Need Statement, and documents describing operational scenarios.

What Is It Used For?

This document serves as, or evolves into, the performance specification for the product or service to be acquired. The acquisition project team uses it as a key element in the solicitation or acquisition requirements documentation. The functional description amplifies information requirements approved in the Operational Requirements Document.

Does It Establish or State Requirements?

Yes. It defines the performance requirements, the environment in which the item must function, and the systems or other products with which it must operate. The functional description serves as the basis for performance specifications contained in contracts, which establish the performance requirements for products, delivered by contractors. It also becomes part of the baseline agreement between industry and DoD as a part of a contract.

Variations?

Many are possible, but each must comply with statutory limits and conform to the acquisition strategy. Refer to the Acquisition Deskbook for information on statutory limits.

REQUIREMENTS TRACEABILITY

Requirements traceability becomes important as the systems developed become more complex. Traceability shows the upward compliance of derived requirements with higher level requirements and the downward completeness of the derived requirements.

After the system concept is determined, major subsystems and configuration items are identified and lower level functions are defined. Then system level elements can be defined. These functions can now be translated into products that will meet the mission need. A specification tree structures the performance parameters for the system being developed. It subdivides the system into its component elements and identifies the performance objectives of the system and its elements. Finally specifications that allow the procurement of individual items are developed.

Higher level requirements must be available when performance specifications are updated. They allow insight into the item's contribution to the next higher assembly.

PROGRAMMATIC REQUIREMENTS

ACQUISITION PROGRAM BASELINE

What Is It?

A threshold is a minimum value of such importance that failure (or even projected failure) to meet one warrants reporting to the MDA and may result in cancellation of the program.

The Acquisition Program Baseline (APB) defines in detail the program objective for each acquisition phase. It contains three parts: performance (which contains KPPs), schedule, and cost. Key performance parameters from the ORD and their associated objectives and thresholds are included in the APB. Each objective equals its threshold, or improves upon it by an affordable, operationally meaningful, and cost-effective increment. As the requirements evolution and acquisition milestone process progresses, the APB changes focus from concept (Milestone I) to development (Milestone II) to production (Milestone III). An Acquisition Program Baseline is submitted with the required milestone information at Milestone I and at each succeeding milestone.

Who Prepares It?

The technical specialist on the program's working-level integrated product team (IPT) prepares an Acquisition Program Baseline with user representation input. Depending on the size and importance of the program, the technical specialist can be the program manager, the program manager's representative, the project engineer, or the item manager. The industrial base participates informally through the

Set realistic values for performance, schedule, and cost parameters.

Consider the capabilities of industry as well as those of government laboratories and other participants.

market survey process. Close coordination with the user and resource manager through a cost/performance integrated product team process is essential. An APB is submitted for Program Executive Office (PEO) or Component Acquisition Executive (CAE) oversight and MDA approval.

For Whom Is It Written?

The APB is an essential part of management of the acquisition process. It serves as a means of obtaining corporate commitment for a program from the entire acquisition chain of command, of measuring performance, and of establishing "trade-space" for the program management team. The APB is used by the project IPT.

What Are The Inputs?

The format for the ABP is included in the Consolidated Acquisition Reporting System (CARS).

The Acquisition Strategy, the ORD, original thinking from the project team, inputs of cost thresholds and objectives, cost as an independent variable analysis, schedule, and key performance parameters are included. Supportability, fielding, maintenance planning, and environmental considerations are usually important factors. The Consolidated Acquisition Reporting System (CARS) software collects APB data in uniform format for reporting purposes and for consolidation and forwarding to Congress.

What Is It Used For?

The program office, the program executive officer, and the acquisition executive use the APB as the benchmark for measuring achieved progress (especially during development) to assess whether or not the program is likely to meet the ORD and MSN requirements within its schedule and affordability constraints. The APB documents the agreement between the acquisition executive and the program office regarding the required technical performance, schedule, and cost of a system.

Does It Establish or State Requirements?

Yes. It establishes the IPT acquisition metrics that the project is committed to achieve.

Variations?

There are many possible variations, but any variation must comply with statutory limits and conform to the acquisition strategy. Refer to the Acquisition Deskbook for information on statutory limits and required contents.

ACQUISITION STRATEGY

What Is It?

The Acquisition Strategy describes at a high level the approved business and management strategy that will be used to acquire a product or service. Acquisition strategies are documented business and technical management approaches designed to achieve program objectives. They include program schedule and structure, and strategies for contracting, funding, design, production, testing, logistics support, and fielding. Essential strategy elements include, but are not limited to, sources of the product or service, risk management, cost objectives and thresholds, contract approach, management approach, environmental considerations, and sources of support.

Detailed performance requirements and mandatory delivery dates should be avoided at this time. Premature detailed requirements are counter to evolutionary requirements definition and inhibit cost, schedule, and performance trade-offs. The acquisition strategy should provide for the validation of the technologies and processes required to achieve critical characteristics and meet operational constraints. It should also address the need and rationale for concurrence—and for prototyping, considering the results of technology development and demonstration. Plans for the next phase should address risk areas.

The MDA approves the acquisition strategy as part of the decision process for Milestones II, III, and I. Although there is no requirement for an acquisition strategy "Report," each program manager develops and documents the strategy that will serve as a roadmap from program initiation through post production support.

Who Prepares It?

The acquisition manager, the project office, and the project leader (engineer, item manager, or other) prepare the acquisition strategy through the IPT process. In addition, for major defense acquisition programs (MDAPs) the Integrating IPT (which includes OSD representatives from the office of the Under Secretary for Acquisition and Technology) reviews and helps refine the draft Acquisition Strategy.

For Whom Is It Written?

The project IPT and other members of the acquisition workforce associated with the project use the Acquisition Strategy.

What Are The Inputs?

Acquisition policies, the ORD, senior DoD staff, senior Service staff, the project team, and the users provide input. The acquisition strategy should reflect the results of the market survey. It is updated at each milestone. While industry does not have a formal role in the development of DoD acquisition strategies, in some cases soliciting industry views regarding potential acquisition approaches may be appropriate. Public meetings held for this purpose should attract non-traditional potential sources as well as the traditional DoD suppliers.

What Is It Used For?

The Acquisition Strategy is a guide or plan for the project's IPT. It is also a road map for program execution. Changes to the Acquisition Program Baseline may necessitate a parallel review of the Acquisition Strategy.

Does It Establish or State Requirements?

No. It does neither; it establishes a plan.

Variations?

The acquisition strategy evolves through an iterative process, becoming increasingly more definitive in describing essential elements of the program and their relationships to each other. Changes to the acquisition strategy may be made between milestones with approval of the MDA.

Like the APB there are many possible variations, but the Acquisition Strategy must comply with statutory limits. (Refer to the Acquisition Deskbook for information on statutory limits.) Under the acquisition reform initiatives more emphasis is being placed on user involvement early on and throughout the acquisition process. Often the user participates in the process by testing products developed by industry or by government labs.

SINGLE ACQUISITION MANAGEMENT PLAN (or equivalent)

What Is It?

The Single Acquisition Management Plan (SAMP), or its equivalent, is a concise, integrated document, which describes relevant issues and provides an acquisition and management approach **tailored specifically** for a given program. The Army calls its version a Modified Integrated Program Summary (MIPS), The Navy's version

is the Navy Master Acquisition Program Plan (MAPP), and the Air Force uses the term SAMP. An outline of a representative SAMP is provided in Appendix D.

Who Prepares It?

SAMP preparation is a collaborative effort on the part of program and working-level IPT members.

For Whom Is It Written?

A SAMP is written primarily for the Defense Acquisition Executive (DAE) and Component Acquisition Executives. It also serves the acquisition community as its Integrated Program Summary guidance document.

What Are The Inputs?

The SAMP is largely comprised of the documents required for a particular milestone decision. These would normally include (but would not be limited to) the Acquisition Plan, Acquisition Program Baseline, Acquisition Strategy, Affordability Assessment, Cooperative Opportunities Document, Environmental Analysis, Human Systems Integration Plan, Integrated Program Assessment, Program Life Cycle Cost Estimate, Risk Assessment, Test and Evaluation Master Plan, and the logistics support strategy.

Other documents, necessary for a milestone decision but too large to incorporate, are typically referenced as annexes to the SAMP. These may include the Analysis of Alternatives, Cost Analysis Requirements Description, Mission Needs Statement, Operational Requirements Document, and JROC Assessment and System Threat Analysis Report (STAR).

What Is It Used For?

The SAMP integrates the acquisition documentation required by senior acquisition officials into one file. This management framework, used to support program decisions, reduces redundant documentation.

Does It Establish or State Requirements?

The SAMP does not establish requirements. Some documents, incorporated into some SAMPs, for example the ORD and the APB, document established requirements.

Variations?

Yes. In fact, there is no prescribed format that a SAMP must follow. However, the SAMP should include only the level of detail and emphasis appropriate for a given program.

TEST AND EVALUATION MASTER PLAN

What Is It?

A Test and Evaluation Master Plan (TEMP) documents the overall test and evaluation (T&E) strategy of the program, including its structure and objectives. It provides a framework within which to generate detailed test and evaluation plans, and it documents schedule and resource requirements associated with the test and evaluation program. The TEMP focuses on the overall structure, major elements, and objectives of the test and evaluation program. The TEMP must be consistent with the overall acquisition strategy.

Who Prepares It?

TEMPs are developed through the IPT process. The program manager is responsible for submitting a TEMP for approval. For a joint program, the lead service is responsible for preparation and coordination of the TEMP.

For Whom Is It Written?

It is written for the PEO or the developing agency, the Operational Test Agency, the user, the Component Acquisition Executive, and OSD. It communicates the T&E strategy and the efforts to mitigate risk to everyone in the acquisition process. Organizations that prepare and provide support, hardware, personnel, or other assets and who participate in the testing are also part of the target audience for a TEMP. This interface document gives the program manager and the testers a common understanding of the assets (e.g., prototypes, production units, test personnel) needed to perform the tests, the general configuration of the tests, and test schedules. Schedules address not only dates of testing but also dates for the delivery of items to be tested, required training and manuals, and test results.

What Are The Inputs?

Primary input is the ORD. The TEMP is developed through the IPT process; the program manager provides Parts I, II, and III, and the developmental resource requirements of Part V. The operational testers write Part IV and provide operational test resource

requirements for Part V. The IPT reviews and comments on the parts until all are satisfied that the TEMP reflects a T&E strategy that will demonstrate effectiveness and suitability as defined by the ORD's key performance parameters. Also the owners of test facilities and fleet or field assets provide input for scheduling and resource requirements.

What Is It Used For?

The TEMP articulates the program manager's plan for test and evaluation of the system as it moves through the acquisition process. It cements firm agreement among the acquisition team members and ensures that all acquisition members understand the T&E requirements and agree to provide the necessary assets or support to the program. It defines unique long lead items required for test and evaluation. It is intended to ensure that risks of concurrent development are understood and acceptable, and that test schedules support the acquisition schedule.

Does It Establish or State Requirements?

It does not establish system requirements, but it is derived from the requirements document for the program. It does identify T&E assets required to accomplish the T&E strategy. The TEMP translates user requirements into testable critical operational issues, measures of effectiveness, measures of suitability, and measures of performance. It documents the degree of testing agreed upon by the user, the acquisition community, and the test community. In that context it states agreed upon test requirements.

Variations?

DoD 5000.2-R has established a mandatory format for all ACAT I and IA programs and other programs designated for the Office of the Secretary of Defense T&E oversight. The services may utilize the TEMP format for all other ACAT programs. A program consisting of a collection of individual systems requires a Capstone TEMP to integrate the T&E. This Capstone TEMP defines the integration and interoperability required to satisfy total systems requirements.

Chapter 3:

Contractual and Contractor-Generated Requirements

CONTRACTUAL REQUIREMENTS

DATA ITEM DESCRIPTIONS

What Are They?

Data Item Descriptions (DIDs) are documents approved by the Department of Defense that describe the format and content of data requirements. Once a DID is approved, it is listed in DoD 5010.12-L, Acquisition Management System and Data Requirements Control List (AMSDL). The Contract Data Requirements List (CDRL), which identifies the DIDs for a particular contract, is the accepted means of placing a data requirement on contract.

Who Prepares Them?

Anyone may prepare a DID, but only an authorized component data manager may submit it to the DoD AMSDL Clearance Office for inclusion in the AMSDL. DIDs can be obtained from DoD Single Stock Point, Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094, (215) 697-2667 or 2179.

For Whom Are They Written?

Anyone who needs to order data uses DIDs. DIDs allow program managers to take advantage of the prior experience of other DoD offices in defining data requirements. They assist component data managers in assessing the adequacy of contract data requirements. They provide a specific, clearly identified location for all data requirements in a contract. Use of standardized DIDs minimizes misunderstanding of data requirements between the government and the prime contractors, and between the prime contractors and their various tiers of subcontractors.

What Are The Inputs?

DIDs accurately describing requirements should already exist. A program should be able to select from existing DIDs to meet its data requirements because similar data requirements have been required by prior programs. Regulatory documents and management/maintenance requirements usually dictate the kind of information required by a program. Program-unique data requirements may require generation of a new DID.

What Are They Used For?

They communicate data requirements to contractors. Those managing the contract also use them.

Do They Establish or State Requirements?

Yes.

Variations?

In accordance with Public Law 104-13, Paperwork Reduction Act, DIDs may only be tailored down. Any addition, modification, or change that tailors up the data requirement requires DoD approval.

In unique cases, when data will only be required once, each DoD service or agency has the option of issuing a one-time DID for use in a single solicitation. This option gives the flexibility to try new ideas. If a one-time DID works, and is subsequently found to be needed in other solicitations, it can be submitted for approval as a standard DID.

STATEMENT OF WORK

What Is It?

The Statement of Work (SOW) defines either directly, or by reference to other documents, all work (non-specification) performance requirements, and data requirements (by referencing the CDRL) for contractors.

Who Prepares It?

The materiel developer prepares the SOW. As with other documents prepared by the materiel developer, the author can be the project management office, the project engineer, or the item manager, depending on the size and importance of the procurement.

For examples of performance statements of work visit this web site:

http:\\www.acq-ref.navy.mil/turbo/arp34.htm

For Whom Is It Written?

It is written for those elements of the industrial base that will respond to the solicitation and for the members of the acquisition workforce who are involved with the program.

What Are The Inputs?

The Acquisition Strategy, The Acquisition Plan, the Acquisition Program Baseline, the Operational Requirements Document, the Test and Evaluation Master Plan, the work breakdown structure, and original thinking from the project team are inputs.

What Is It Used For?

A performance-based SOW states:

- Specific, clearly defined program goals.
- Technical and schedule goals in terms of results.
- Methods of performance measurement.
- Clearly established deliverables and other reporting requirements.
- Mandatory requirements limited to the government's actual needs.

This document describes the work to be done in developing or producing the goods to be delivered or the services to be performed by a contractor. It communicates work requirements (hardware, software, technical data and logistics support, goods or services) to the performing contractor. As part of the contract, it also forms the basis for determining successful performance by the contractor.

Caution should be used to ensure that a SOW does not mandate use of specific technical management processes. Making processes mandatory limits the ability of the contractor to provide innovative solutions and makes it very hard to adopt fast-paced commercial practices. Unless there is a critical need for a process to be on contract, the SOW should not include it. This exclusion does not mean that the government does not care about the processes: in fact the government may choose to review key processes during proposal evaluations. Offerors' proposed technical and management processes can and should be evaluated, but the proposed processes should not be contractually invoked.

Does It Establish or State Requirements?

Yes. The SOW may establish the metrics (measures of performance) that the contractor and the DoD buying activity will agree to as a part of the contract. These metrics should be stated in performance terms whenever possible.

Variations?

Many are possible. Each must comply with statutory limits and conform to the Acquisition Strategy and Acquisition Program Baseline. (Refer to the Acquisition Deskbook for information on statutory limits.) An alternative to a statement of work is a Statement

of Objectives which shifts the responsibility for preparing the statement of work from the government to solicitation respondents.

STATEMENT OF OBJECTIVES

What Is It?

The Statement of Objectives (SOO) provides the government's overall objectives for a solicitation. The offeror uses the SOO (along with the rest of the Request for Proposal (RFP)) as the basis for preparing his proposal, including the proposed contract work breakdown structure, the SOW, and the Contract Data Requirements List. Figure 3-1, *SOO Development*, shows the process of generating a SOO and the eventual creation of a contract SOW and the associated technical specification.

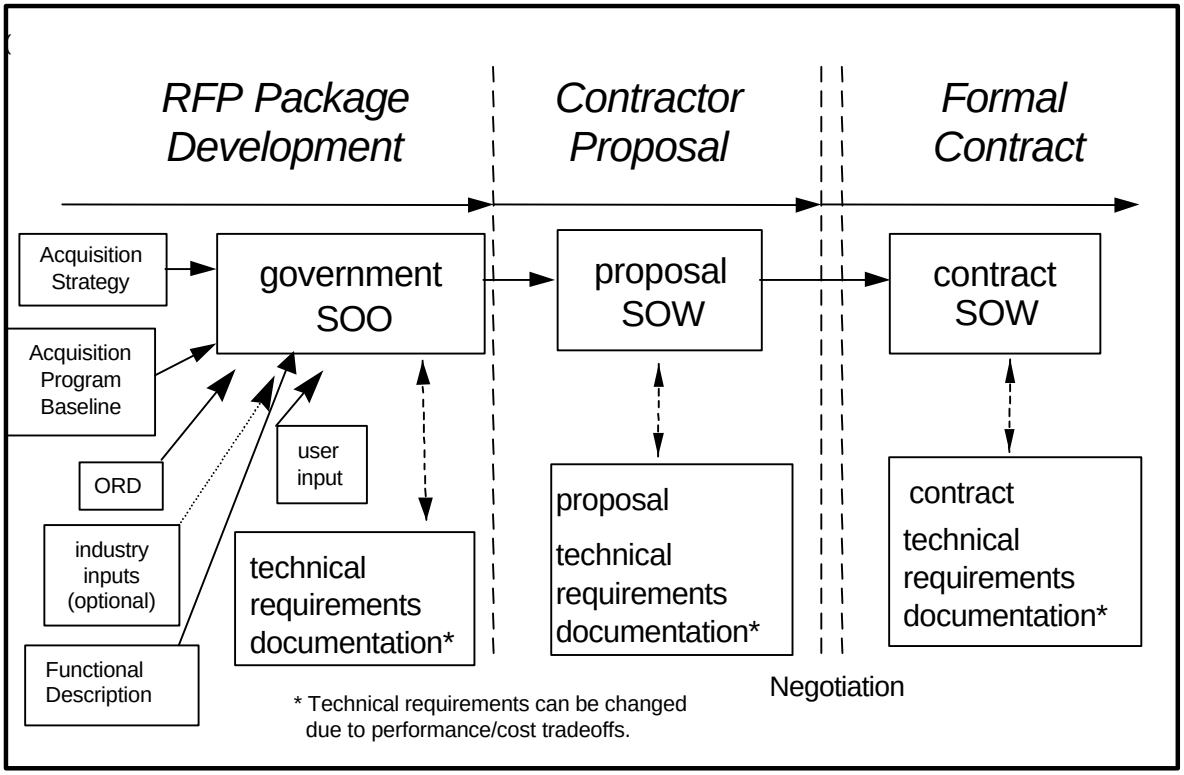


Figure 3-1 SOO Development and Contractor Generation of the Contract SOW

SOOs are closely related in concept and intent to performance based statements of work. In both cases contractors are given greater flexibility but assume greater risk. In the SOO, flexibility and risk assume their fullest expression.

SOOs dramatically compress requirements.

For a major system (ACAT I or II), a SOW typically contains 30 pages.

An equivalent SOO is 2-4 pages long.

The SOO eliminates virtually all "how to" directions, not only in the content of management plans and processes, but also by avoiding even the identification of the main elements of management processes. A SOW typically provides at least an outline of required program elements; the SOO frees offerors to propose their own programs for meeting the government's top level objectives. This extreme flexibility frequently results in significantly different offeror proposals, so proposal evaluation is longer and more complex. In evaluating a SOO, review all offeror-proposed SOWs for consistency with the SOO, and be sure that offerors have clearly defined all major terms, metrics, and reporting procedures.

Who Prepares It?

The SOO is drafted by the government program office with assistance from relevant technical experts (e.g., system engineering, testing, and logistics) and is subject to approval by the contracting office. The SOO and program-unique technical requirements documents establish performance objectives and requirements that the contractor must address in his development of a program SOW.

For Whom Is It Written?

See MIL-HDBK-245 and the DoD Acquisition Deskbook for guidance and examples of SOOs.

The SOO helps the program office and others associated with a particular procurement establish a common understanding of the program objectives for the specific contract effort. The SOO is written for the potential offerors and included as part of the RFP. The SOO must contain the essential performance objectives that contractors will have to fulfill under the contract. These objectives thus must be addressed in their proposals to the government.

What Are The Inputs?

The Acquisition Strategy, Acquisition Program Baseline, Operational Requirements Document, user inputs, and original thinking from the project team are used in preparing a SOO. If the RFP has been issued in draft form before its formal release, input from industry may be available.

What Is It Used For?

This document establishes the objectives for the product or service to be acquired. The acquisition project team uses this document as a key element of the solicitation and acquisition requirements documentation, and contractors use it as the basis for proposal preparation.

Does It Establish or State Requirements?

Yes. It establishes performance objectives that contractors must address in their proposals.

Variations?

A performance SOW that requires contractors to respond with an updated SOW in their proposals is a possible variation. A SOW should not be required when requirements can be expressed in performance terms.

MILITARY SPECIFICATIONS

What Are They?

Military specifications describe the essential technical requirements for procurement of military-unique items or substantially modified commercial items. They also include the criteria for determining whether the requirements are met. There are two types of military specifications—performance and detail. The differences between performance specifications and detail specifications are identified below:

Performance Specifications

- Define form, fit, function, and interfaces.
- State requirements in terms of results, not methods.

Detail Specifications

- Define "how to" satisfy requirements.
- Mandate design solutions.
- List materials.
- Describe manufacturing processes.
- May contain both performance and detail requirements.

Who Prepares Them?

They are written by DoD preparing activities identified under the Defense Standardization Program. Preparing activities are responsible for drafting, coordinating, and maintaining the specifications they prepare.

For Whom Are They Written?

Specifications communicate the users' needs to DoD acquisition personnel and DoD contractors. They also serve to define interfaces with other systems for DoD, contractors, and allied forces personnel.

What Are the Inputs?

The users' requirement and market research are prime inputs. Figure 3-2, *Preparing Performance Specifications*, shows some of the information needed to develop a performance specification.

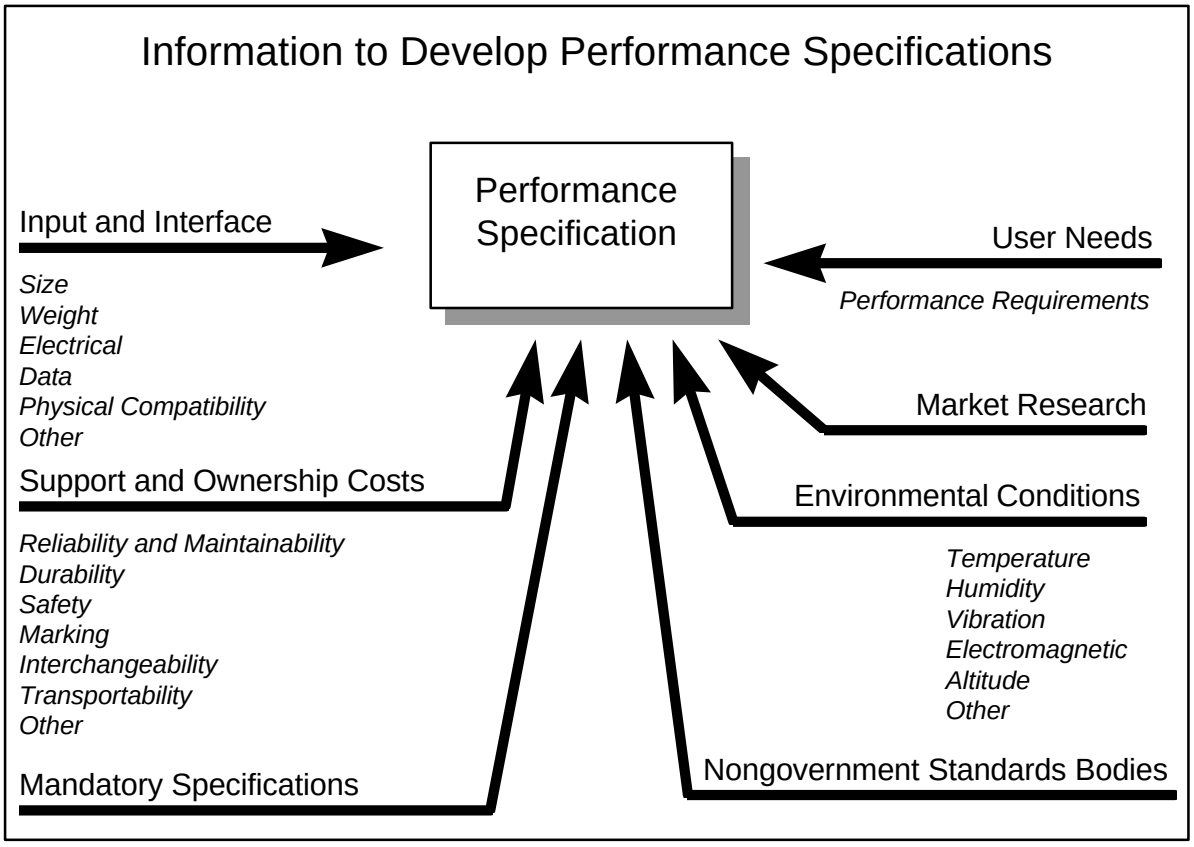


Figure 3-2 Preparing Performance Specifications

What Are They Used For?

Specifications communicate technical requirements to DoD contractors. They are used in the acquisition process. They are also used to determine whether items offered in response to a solicitation or supplied under contract are acceptable. As suggested above, they also define interfaces with other systems for purposes such as interoperability, commonality, and future upgrades.

Do They Establish or State Requirements?

Yes.

Variations?

Nongovernment standards, commercial item descriptions (CIDs), and federal specifications are standardization documents that serve the same basic function as military specifications. The order of precedence in the use of these specifications is: 1) nongovernment standards written in performance terms, 2) CIDs, 3) federal performance specifications, and 4) military performance specifications. As DoD widens its use of the commercial marketplace in satisfying its needs, performance nongovernment standards and CIDs will be used with increasing frequency.

MILITARY STANDARDS

What Are They?

Military standards are documents that establish uniform engineering or technical criteria, methods, processes, and practices. There are five types of military standards: interface standards, test method standards, manufacturing process standards, standard practices, and design criteria. Closely related to standards are handbooks. Handbooks are for guidance only and can not be made contractually binding, but they can contain the same type of information as standards.

- Interface standard - specifies the physical or functional interface characteristics of systems, subsystems, equipment, assemblies, components, items, or parts to permit interchangeability, interconnection, interoperability, compatibility, or communications.
- Test method standard - specifies procedures or criteria for measuring, identifying, or evaluating qualities, characteristics, and properties of a product or a process.
- Manufacturing process standard - states the desired outcome of manufacturing processes or specifies procedures or criteria on how to perform manufacturing processes.
- Standard practice - specifies procedures on how to conduct certain functions or operations.
- Design criteria standard - establishes military-unique design or functional criteria that must be adhered to in the development of systems, subsystems, equipment, assemblies, components, items, or parts.

- Handbook - offers **guidance** that enhances user awareness by providing engineering information; lessons learned; possible options for addressing technical issues; classification of similar items; interpretive direction and techniques; and any other information that may help DoD or contractors in the design, construction, selection, management, support, or operation of systems, products, processes, or services.

Who Prepares Them?

Military standards are written by DoD preparing activities identified under the Defense Standardization Program. Preparing activities draft, coordinate and maintain the standards they prepare. Standards are coordinated with industry as well as with government agencies.

For Whom Are They Written?

They are used by defense contractors and government personnel. Standards referenced in specifications or statements of work are included in solicitations and contracts as needed.

What Are The Inputs?

Technical expertise, market research, experience, and user requirements for processes and services provide input to military standards.

What Are They Used For?

Military standards communicate technical requirements, technical information, or non-mandatory guidance related to processes or procedures.

Do They Establish or State Requirements?

Yes.

Variations?

Nongovernment standards and federal standards are standardization documents that serve the same function as a military standard.

SECTIONS C, L & M OF A SOLICITATION

What Are They?

Section C establishes requirements for the work effort, Section L instructs offerors on how to prepare their proposals, and Section M

describes the ground rules for proposal evaluation. When considered together, Sections C, L, and M should convey to the offerors a clear understanding of the areas in which they can make technical and cost tradeoffs in their proposals to best satisfy the government requirements.

Who Prepares Them?

These sections of the solicitation are written by the government procuring agency. An inconsistent solicitation may result if different groups of people, representing different functional areas, develop the different sections without coordination or proper guidance. Development of a multidisciplinary acquisition team—whose members are stakeholders in the acquisition and have a commitment to work together—and coordination between those team members is one of the best ways to ensure consistency.

The contracting officer is responsible for the solicitation and has final authority in the solicitation and contract documents. He or she insures that all sections of the solicitation are properly integrated and coordinated. In competitive solicitations, which follow formal source selection procedures, the contracting officer may be assisted by the Source Selection Evaluation Board.

For Whom Are They Written?

Sections C, L, and M of the solicitation work together to communicate government requirements to potential offerors in context with all other parts of the solicitation.

What Are the Inputs?

Inputs come from the following documents:

- Operational Requirements Document
- Acquisition Program Baseline
- Acquisition Strategy
- Test and Evaluation Master Plan
- Specifications and standards

Standards and specifications—if cited in Sections C—can have a significant impact on the acquisition by establishing requirements not only for the product, but also the process to achieve that product.

Inputs to these sections are also provided by functional specialists (i.e., systems engineers, environmentalists, logisticians, etc.).

What are They Used For?

Once the decision has been made that an acquisition is the best approach to fill the need, these sections, along with other sections as described by the uniform contract format, communicate the requirements to industry. A solicitation is prepared using the contract requirements package and all other relevant information. Section L and Section M must be consistent with Section C. The instructions and evaluation factors will affect the ability of the government to select the best approach to meet the stated requirements.

Do They Establish or State Requirements?

Yes. Combining these sections with the other information in an RFP is the way the government defines the requirement and communicates it to industry. The government should use functional or performance requirements to the maximum extent possible. The benefits of using performance specifications are that they can lead to offeror innovation, provide the potential for faster contract performance than detail requirements, and they allow maximum flexibility for government and industry, including an increased probability of utilizing commercial and nondevelopmental items to fulfill the government's requirement.

Variations?

Variations are allowed to satisfy a stated need.

If a SOO is used, Section L needs to explain what the contractor must include with his proposal. See the box below for possible wording.

ADDRESSING THE SOO IN SECTION L

Section L, Instructions, Conditions, and Notices to Offerors, should include instructions to the offeror that require all aspects of the SOO be addressed in the submitted proposal.

Here is a sample of potential Section L wording:

The Statement of Objectives (SOO), included as [cite location of SOO in the RFP], provides the government's overall objectives. The offeror shall use the SOO, together with other applicable portions of this RFP, as the basis for preparing their proposal and shall ensure all aspects of the SOO are addressed. The proposal should include (as applicable) a Contractor Work Breakdown Structure, a Statement of Work, an Integrated Master Plan, and other documents as necessary. The SOW should specify in clear, understandable terms the work to be done in developing or producing the product to be delivered or services to be performed by the contractor.

CONTRACTOR-GENERATED REQUIREMENTS

TECHNICAL DATA

What Is It?

Technical data documents the design and engineering decisions that define a product. It is an integral part of the engineering process and is the primary vehicle used to provide the information necessary for the development, manufacture, or acquisition of the item or system. This data includes, but is not limited to, engineering drawings, associated lists, performance and process specifications, standards, manufacturing criteria, quality support criteria, operator's manuals, maintenance manuals, and packaging details.

Who Prepares It?

Technical data is produced during the design process as a result of various engineering functions which include design engineering, drafting, manufacturing process planning and development, quality control, and packaging development.

For Whom Is It Written?

In the production area, this data is used by manufacturers to produce the item, perform quality control functions, and deliver the finished product. In the user's area, this data is used by all the support functions including repair, overhaul, testing, modification, longevity analysis, configuration management, and field level maintenance. In both areas, technical data is the primary tool used to assure configuration integrity.

What Are The Inputs?

Requirements are established based on program objectives, performance parameters, established maintenance support concepts, and the projected life of the system including potential future enhancements. Specific technical data criteria are based on the stated maintenance concepts and existing and projected capabilities, each tempered by extensive experience in the life-cycle support of military weapons systems.

What Is It Used For?

In the production environment, technical data supports design decision making, manufacturing planning, quality control development, maintenance engineering, packaging engineering, and all other logistics functions necessary to produce and deliver the finished product. In the user community, technical data is the foundation for configuration management, maintenance, repair, overhaul, and testing support. This data also is used in analysis of projected life expectancy, procurement of spares, and development of modifications for enhanced longevity and performance capability. For military systems, the engineering data provides the basis for developing battle damage repair guidance.

Does It Establish or State Requirements?

It is the means by which applicable requirements are turned into a product definition that is documented for the production and life-cycle support of the finished product. Technical data does not establish requirements, but it may contain test criteria for verifying requirements. This provision is especially important when the requirements are stated in performance terms.

Variations?

Many variations are possible within existing practices and parameters. Existing standards prepared to guide technical data development allow for wide variations based on the item documented, the uses to which the data will be applied, and the technology applications employed by the users.

SYSTEM SPECIFICATION

(Or Program Unique Specification)

What Is It?

A system specification states the technical and mission requirements for a system, allocates requirements to the functional areas identified in the work breakdown structure, and defines the interfaces among those functional areas. System specifications for the development of a new system state the requirements for design or engineering during the development phases. It can describe a system, item, software, process, or material developed and produced for use within a specific program.

Who Prepares It?

The system specification is prepared either by the government development contractor or by the government program office. A principal output of the system development process is a complete system specification. The contractors selected to develop the system have configuration control to the maximum extent possible and are responsible for the development and maintenance of the specification. The government reviews the proposed specification at various times during contract execution and during contract negotiations.

For Whom Is It Written?

It is written for the prime contractor who will develop and produce the system, and for future contractors if subsequent procurements occur. The government also uses it to review the proposed system (and subsequent changes) to assure itself of the probability that the end products will meet its requirements.

What Are the Inputs?

The user's requirement and market research are the initial inputs. Early in the acquisition process, contractors propose broad top level specifications. As the acquisition progresses, these specifications are refined and expanded. A major input is engineering analysis and preliminary design effort together with input from functional specialties.

What Is It Used For?

The system specification describes the product of a complex systems development. It also may describe a less complex system – one that might be described by a military specification – if it is judged to have little potential for use by other acquisition programs. The initial version of the system specification establishes the overall performance expectations for the system. The system specification evolves and is continuously updated during the development process. It culminates in a final version that forms the future performance base for the development and product specifications for the system and its subsystems. The performance of the system and subsystems is allocated from the system performance requirements. Presuming that technical tradeoff is also incorporated into the system specification, some cost estimating (hopefully on a life cycle basis, not just for development or production) would also be a significant input.

MIL-STD 961D, Appendix A, describes in detail the content of the system specification, item specification, software specification, process specification, and materiel specification.

OPEN SYSTEMS DEFINITION

An open system is a system composed of subsystems and components that rely on common formats and services, allowing relatively easy system upgrades. An open system is characterized by:

- Well defined, widely used, non-proprietary interfaces or protocols.
- Use of standards for defining those interfaces—primarily standards developed or adopted by industrially recognized standards bodies.
- Explicit provision for expansion or upgrade through the insertion of new technology.
- Use of performance specifications to describe the system.

It is very difficult to state all requirements in performance terms. However, minimizing the detailed requirements and maximizing the performance requirements substantially benefits the system over the product's entire life cycle. When performance and interface requirements are in place, it is easier to have competition, find alternative sources, and finally, interject emerging technologies.

Do They Establish or State Requirements?

Yes. The system specification not only establishes requirements, it also establishes the methods to verify that the requirements have been met.

Variations?

These program-unique specifications are one of the main products of the systems engineering process. Not only do they differ for each phase of the acquisition but also each acquisition is unique and therefore its system specification is unique. Variations are encouraged to help program management be flexible and innovative.

OPEN SYSTEMS CONCEPT

Open systems are designed to improve the performance and lower the cost of weapon systems by taking advantage of competition and innovation in the commercial market.

Open systems describe the system in performance terms. They spell out only the form, fit, and function of the system's components. This approach gives the manufacturer design flexibility and maximizes the opportunity to offer a commercial or nondevelopmental solution.

In an open system the requirement is fulfilled by use of components (hardware or software) that use publicly available interfaces which are either not proprietary or, if proprietary, are readily made available for purposes of functional interface.

An open system approach usually allows specific parts, products, and technology to be used across a wide range of systems with minimal changes.

Requirements documents need to establish the level at which open systems will be applied. Offeror proposals should indicate the levels at which open systems are proposed within each major element of the work breakdown structure.

Chapter 4: The Requirements Process

THE ACQUISITION PROCESS

This chapter discusses the evolution of requirements throughout the acquisition life cycle. Figure 4-1, *The Acquisition Process*, serves as a road map for that discussion.

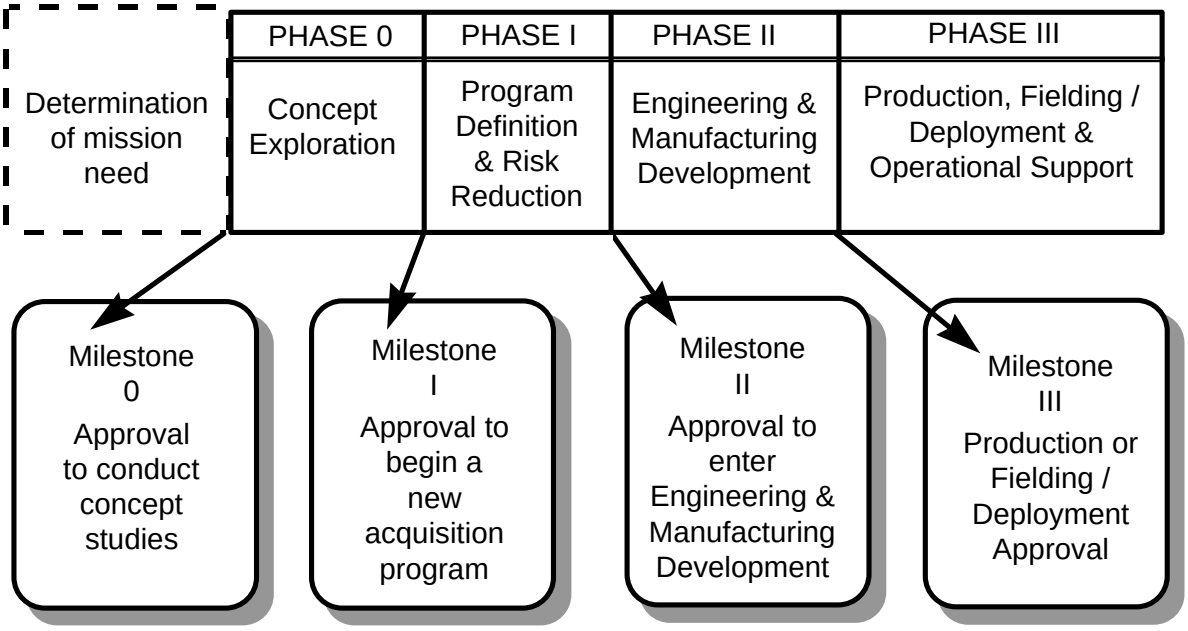


Figure 4-1 The Acquisition Process

THE ROLE OF MARKET RESEARCH

Researching the potential of the commercial marketplace to meet system performance requirements is an essential element of building a sound set of requirements. This evaluation of the research should be included in the initial ORD. The program manager and/or the user initiates the market research to determine whether an existing product will meet the need. Market research is required by statute (10 USC

2305 and 2377) and FAR 11.002. Independent evaluators participate in the market research by identifying issues, which should be addressed to ensure suitability and supportability. The test and evaluation specialist provides insight into the validity of any existing test data and helps to specify additional testing required to assess item suitability. The logistician provides experience in the support philosophy of spare parts, maintenance, warranties, and other support issues for the potential commercial item.

REQUIREMENTS GENERATION KEY PLAYERS

Figure 4-2, *Requirements Generation Key Players*, depicts how specific requirements evolve from their development to final disposition. It displays the organizations in each service that have cognizance over the requirements generation process. For each service these organizations perform the same four tasks:

- Requirements development
- Lead agency control (responsible agency at service headquarters)
- Requirements validation
- Materiel development

	Requirements Generation Key Players			
	Army	**Navy**	**USMC**	**Air Force**
Requirements Developer	TRADOC	OPNAV (N-8) Fleet CINCs	FMF/MCCDC	Operating Commands
Service HQ Lead Agency	DCS for Opns & Plans (DCSOPS)	OPNAV (N-8) Program Sponsors	DCR for Rqmts. & Programs	DCS for Opns & Plans (HQAF/XO)
Requirements Validation Authority **ACAT I & IA**	ACAT I: Joint Requirements Oversight Council (JROC) ACAT IA: OSD Principal Staff Assistant (PSA)/JROC			
ACAT II & III	Chief of Staff	Chief of Naval Operations/N-8	Marine Corps Commandant	Chief of Staff
Primary Materiel Developer	Army Materiel Command	System Commands	USMC Systems Dev. Cmd.	Air Force Materiel Command

Figure 4-2 Requirements Generation Key Players

REQUIREMENTS DOCUMENTATION

Figure 4-3, *Requirements Documentation*, summarizes some key points in the process of documenting the requirements addressed in this handbook. The figure identifies the source of the requirement, by whom it is prepared and approved, and whether it has a mandatory format. Except for the Mission Need Statement, the requirements are used at Milestones I, II, and III, if they are needed or required. The Mission Need Statement is prepared for Milestone 0, but it is needed at each milestone.

The items below expand on some of the information in the figure. They are keyed to the superscripts in the figure.

1. Recent acquisition policy changes have been giving the program manager increasing latitude in determining the format of the various requirements documents.

2. As Figure 4-2, *Requirements Generation Key Players*, indicates, the approval level for the Mission Need Statement depends on the program's ACAT level.

3. The 28 April 1995 OUSD(A&T) memorandum, *Reengineering the Acquisition Oversight and Review Process*, requires a document "similar" to a Single Acquisition Management Plan.

4. No DoD level mandatory policy addresses the Statement of Objectives, although it is discussed along with the Statement of Work in several non-mandatory documents. For the Solutions-Based Contracting pilot program, the Federal Acquisition Reform Act requires a "results oriented statement of work" that is limited to end results or performance capabilities desired.

5. If a Statement of Objectives is used in a solicitation, the contractor will usually prepare the Statement of Work.

Program Document	Source of Requirement		Prepared By	Approved By	Mandatory Format [1]
	Statutory	Regulatory			
Mission Need Statement		DoD 5000.2-R Para. 2.3 & CJSCI 3170.01	User's Representative	JROC and lower [2]	No (but mandatory content)
Operational Requirements Document		DoD 5000.2-R Para. 2.3 & CJSCI 3170.01	User's Representative	JROC and lower	Yes
Functional Description		Mil-Std-498	Combat Developer	User's Rep.	No
Acquisition Program Baseline	10 USC 2435	DoD 5000.2-R Para. 3.2.2	PM/ Materiel Developer	Milestone Decision Authority	Yes
Acquisition Strategy	Multiple	DoD 5000.2-R Para. 3.3	PM/ Materiel. Developer	Milestone Decision Authority	No
Single Acquisition Management Plan		OUSD(A&T) Memo, 4/28/95 [3]	PM/ Materiel Developer	Milestone Decision Authority	No
Test and Evaluation Master Plan	10 USC 2399	DoD 5000.2-R Para. 1.5	PM/Test Community	DOT&E DTSE&E	Yes
Data Item Descriptions		DoD 5000.2-R Para. 3.3	Materiel Developer	Component Data Manager	Yes
Statement of Work		FAR Part 7	PM/ Materiel Developer/ Contractor [5]	DoD Contracting Officer	No
Statement of Objectives [4]					No
Military Specifications		DoD5000.1 Para. 1i	Preparing Activity	Preparing Activity	Yes
Military Standards		Mil-Std-962C	Preparing Activity	Standardization Executive	Yes
Sections C, L, & M of a Solicitation		FAR Part 15	DoD Contracting Officer	DoD Contracting Officer	No
Technical Data		Multiple	Contractor	PM/Materiel Developer	No
System Specification		Multiple	Contractor	PM/Materiel Developer	No

Figure 4-3 Requirements Documentation

REQUIREMENTS GENERATION FLOW

The requirements generation process begins with a determination of mission need and ends when the program is canceled or the system goes to fielding or deployment. After fielding, requirements may still be generated for product improvements but, for the purposes of this discussion, they can be considered requirements for a new program. As can be seen in Figure 4-4, *Requirements Flowchart*, the process is iterative and cross-functional. It requires extensive coordination and cooperation among dozens of agencies.

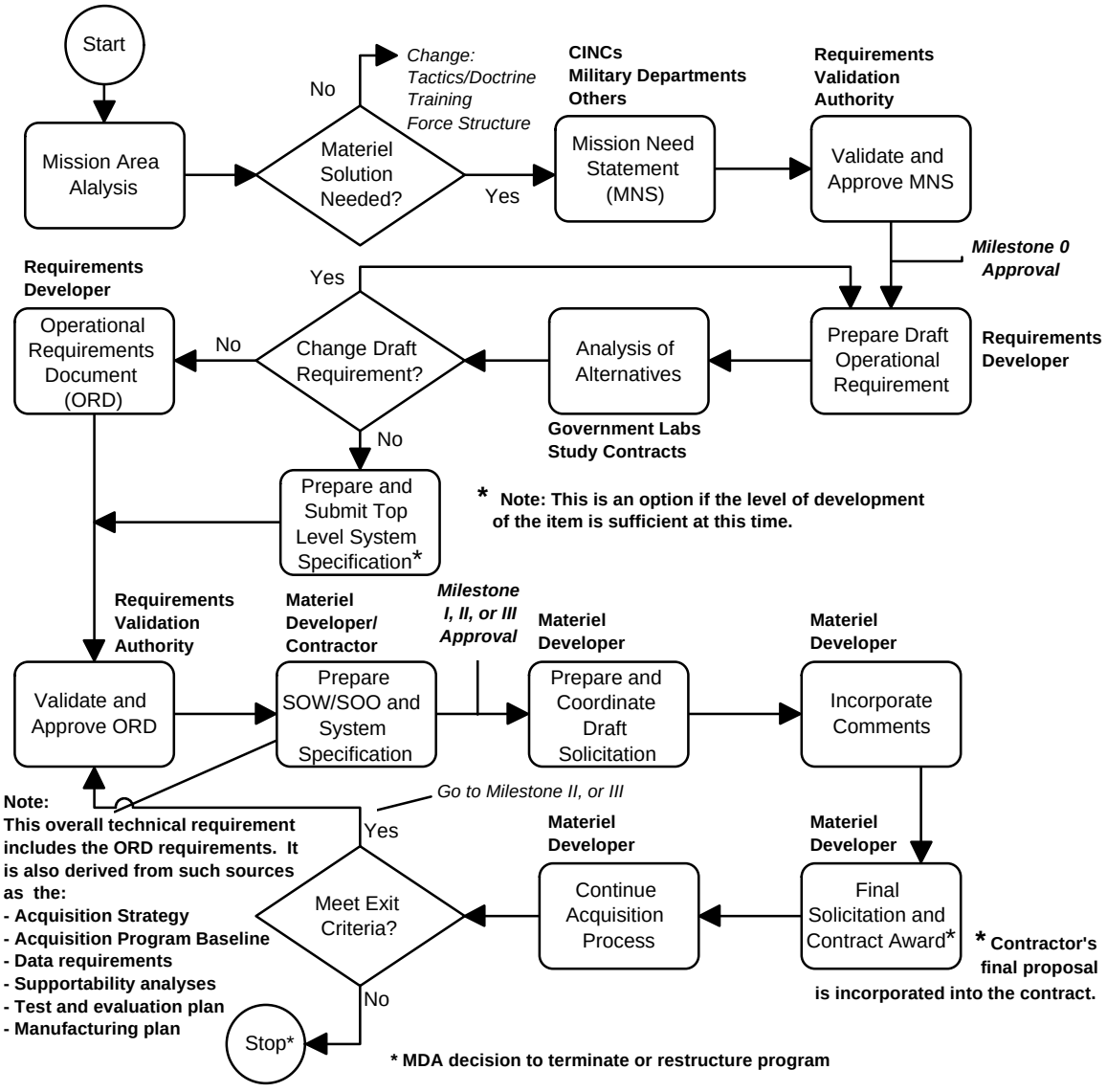


Figure 4-4 Requirements Flowchart

DETERMINATION OF MISSION NEED

All acquisition programs are based on identified, documented, and validated mission needs. Mission needs result from ongoing assessments of current and projected capability. Mission needs may seek to establish a new operational capability, improve an existing capability, exploit new technology, or exploit an opportunity to reduce costs.

In the process of refining requirements, key concepts are adhered to:

- Keep all reasonable options open and facilitate trade-offs throughout the acquisition process.
- Avoid early commitments to system-specific solutions, including solutions that inhibit future insertion of commercial off-the-shelf equipment or components.
- Define requirements in broad operational capability terms.
- Use minimum acceptable operational performance (thresholds) to establish operational test criteria.

Analyses and experimentation are conducted. They include assessments of known and approved programs and opportunities to improve technology such as science and technology objectives, advance technology demonstrations, and advance concept technology demonstrations.

These analyses must reflect a consolidated assessment of all mission needs: near-term needs, those programmed, and future capabilities needed to execute national military strategy.

After a materiel Mission Need Statement has been approved, a draft ORD is prepared. The initial ORD establishes objective values and minimum acceptable operational values (thresholds) for broad (high level) performance parameters, which are based on the MNS. They describe the system capabilities and characteristics of the proposed materiel solutions. The ORD is prepared by the user's representative—the appropriate military service or government agency.

ANALYSIS OF ALTERNATIVES

Once the draft ORD is developed, competitive, parallel, short-term concept studies are usually conducted. The focus of these efforts is to define alternative concepts and evaluate the feasibility of each. These studies provide a basis for assessing the relative merits (i.e., advantages and disadvantages, degree of risk) of these concepts at the next milestone decision point: Milestone I, New Acquisition Program Approval.

Analysis of alternatives (AoA) is used to facilitate comparisons of alternative concepts. The most promising system concepts are defined in terms of initial broad objectives for overall acquisition strategy; test and evaluation strategy; software requirements; cost, schedule, and performance; and opportunities for trade-offs. Early life-cycle cost estimates for the competing alternatives should be analyzed during this phase to determine the value of the expected increase in operational capability relative to the acceptable risk for each and to make an initial assessment of affordability.

Key products of this effort are an approved initial ORD with proposed key performance parameters and the Acquisition Program Baseline. These documents reflect the synchronization and linkage of the requirements trade-offs and operational analyses; the concept studies; the cost/schedule/performance trade-offs; and the analysis of alternatives.

Analysis of alternatives aids the decision process because it illuminates the relative advantages and disadvantages of the alternatives being considered. The AoA will show the sensitivity of each alternative to possible changes in key assumptions (e.g., threat) or variables (e.g., selected performance capabilities). Where appropriate, the AoA includes discussions of interoperability and commonality of components and systems similar in function to other DoD component or Allied programs. The linkage between the AoA, system requirements, and system evaluation measures of effectiveness (MOE) should be clear.

How this analysis, which includes estimated costs and operational effectiveness, facilitates comparisons of the alternative concepts is shown in Figure 4-5, *Analysis Supporting Requirements Determination*. The AoA provides insights regarding KPPs for preferred alternative(s) and indicates how these parameters contribute to increases in operational capability.

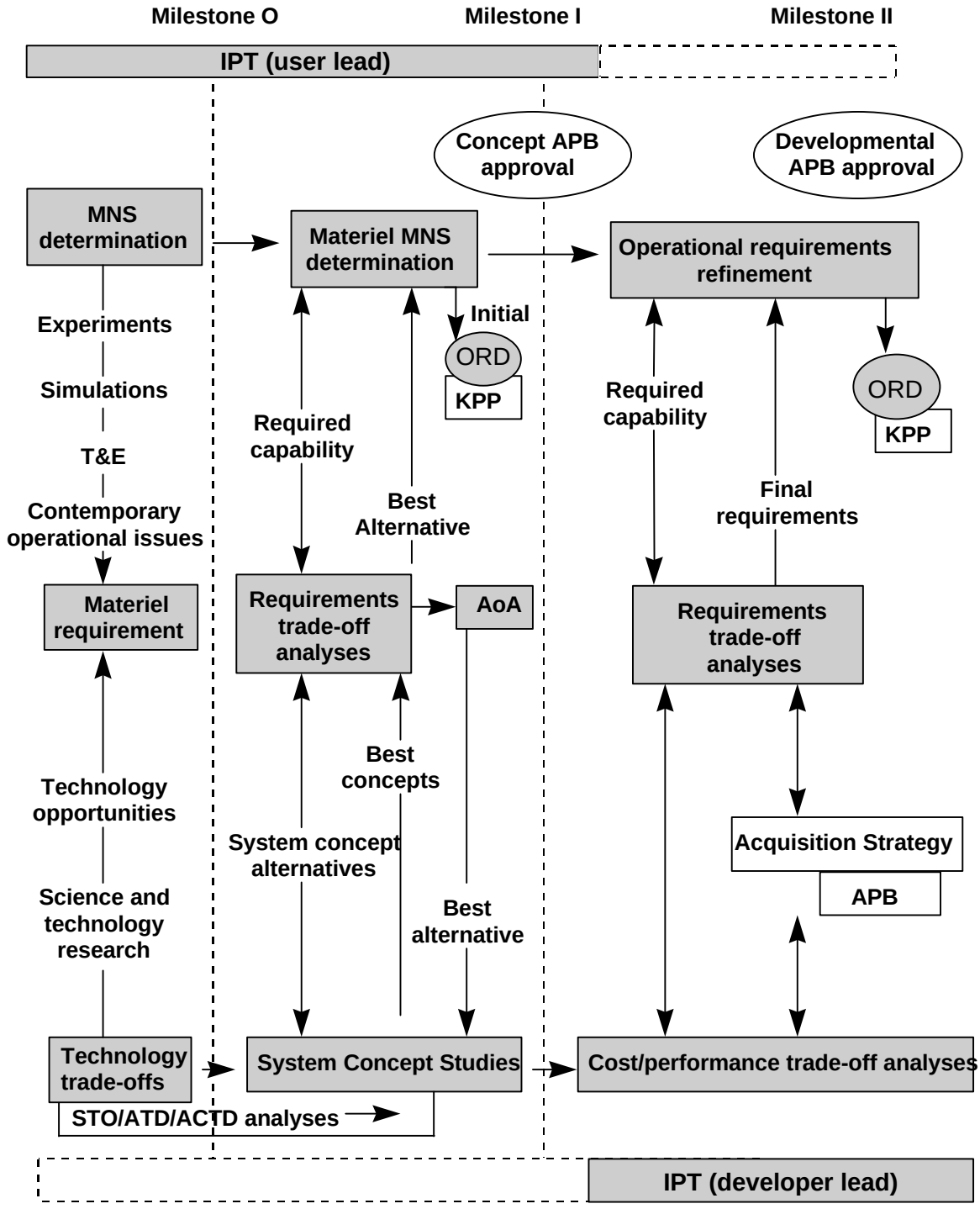


Figure 4-5 Analysis Supporting Requirements Determination

The relationship between the AoA and the ORD, the APB, and the TEMP is shown in Figure 4-6, *AoA Information Flow*. The figure identifies sources of requirements and inputs, elements of the process, and the products (KPPs, MOEs, and measures of performance (MOPs)) that feed the key documents.

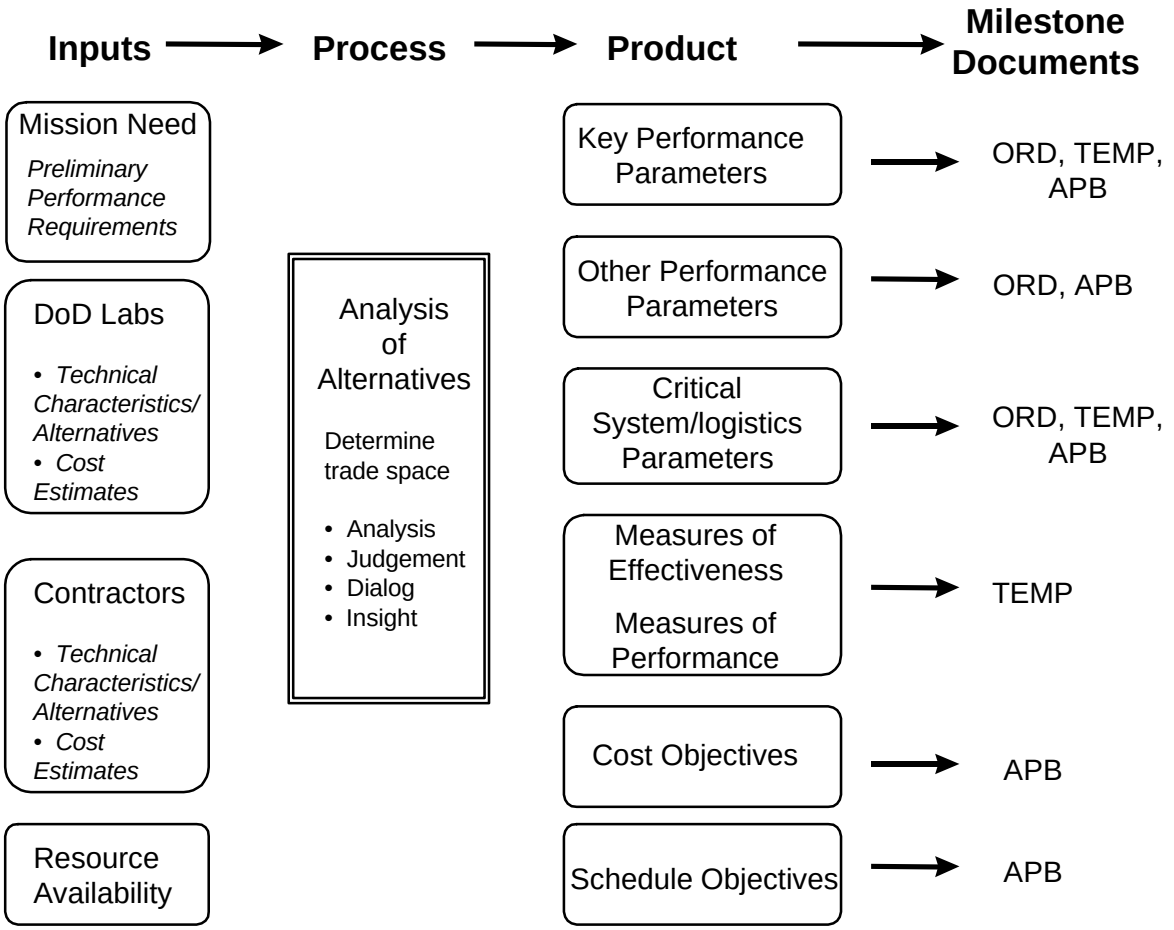


Figure 4-6 AoA Information Flow

Trade-offs among cost, schedule, and performance result from a cost as an independent variable (CAIV) analysis. To assist in generating alternative concepts, conceptual design and design trade-off studies may be performed. The most promising system concepts should be defined in terms of initial objectives for life cycle cost, schedule, and performance. Critical system characteristics and operational constraints (e.g., survivability, transportability, interoperability and security), and infrastructure support requirements should be defined interactively with users or their representatives.

KEY DOCUMENTS THAT FOLLOW THE ORD

Acquisition Program Baseline

The ORD provides a bridge that links the MNS to the APB. It contains three parts: performance (key performance parameters), schedule, and cost (thresholds and objectives). Performance includes supportability and, as applicable, environmental requirements. These performance and cost parameters apply to the end product, not interim products. For example, the APB may state an aircraft range requirement as X and Y miles and the program works toward those objectives and thresholds. Those values will not normally change. In fact a threshold breach would likely result in a program restructure or termination.

EXIT CRITERIA

Performance and cost parameters in an APB apply to the end product, not interim products.

Exit criteria check that suitable progress is being made.

To measure the program's performance incrementally, milestone exit criteria are established by the MDA and used to check that suitable progress is being made. Meeting these criteria at a milestone decision point provides some confidence that the end item's performance requirements will be met.

The program manager, in coordination with the user, prepares the Acquisition Program Baseline, and updates it to provide a greater level of detail as the program matures. The performance and cost parameters will remain the same. It is also updated following a program restructure or an unrecoverable program deviation.

Acquisition Strategy

The program manager also develops an Acquisition Strategy (AS) that serves as the road map for program execution. Essential elements include, but are not limited to:

- sources
- risk management
- CAIV
- contract approach
- management approach
- environmental considerations
- source of support.

The Acquisition Strategy is a key source for updating the Acquisition Program Baseline. It should be tailored to meet the specific needs of individual programs, including consideration of incremental (block) development and fielding strategies. The program manager develops the Acquisition Strategy in coordination with the working-level

integrated product team. The Milestone Decision Authority approves the Acquisition Strategy, the Acquisition Program Baseline, and the Phase I exit criteria at Milestone I.

The Acquisition Strategy states aggressive, achievable cost objectives (taken from the APB) and plans for the achievement of these objectives. Cost objectives balance mission needs with projected out-year resources, taking into account anticipated process improvements in the Department of Defense and the defense industries. To achieve these cost objectives, cost is treated as an independent variable within the constraints of the funding line. Figure 4-7, *CAIV Methodology*, provides a step by step process for assessing trade-offs.

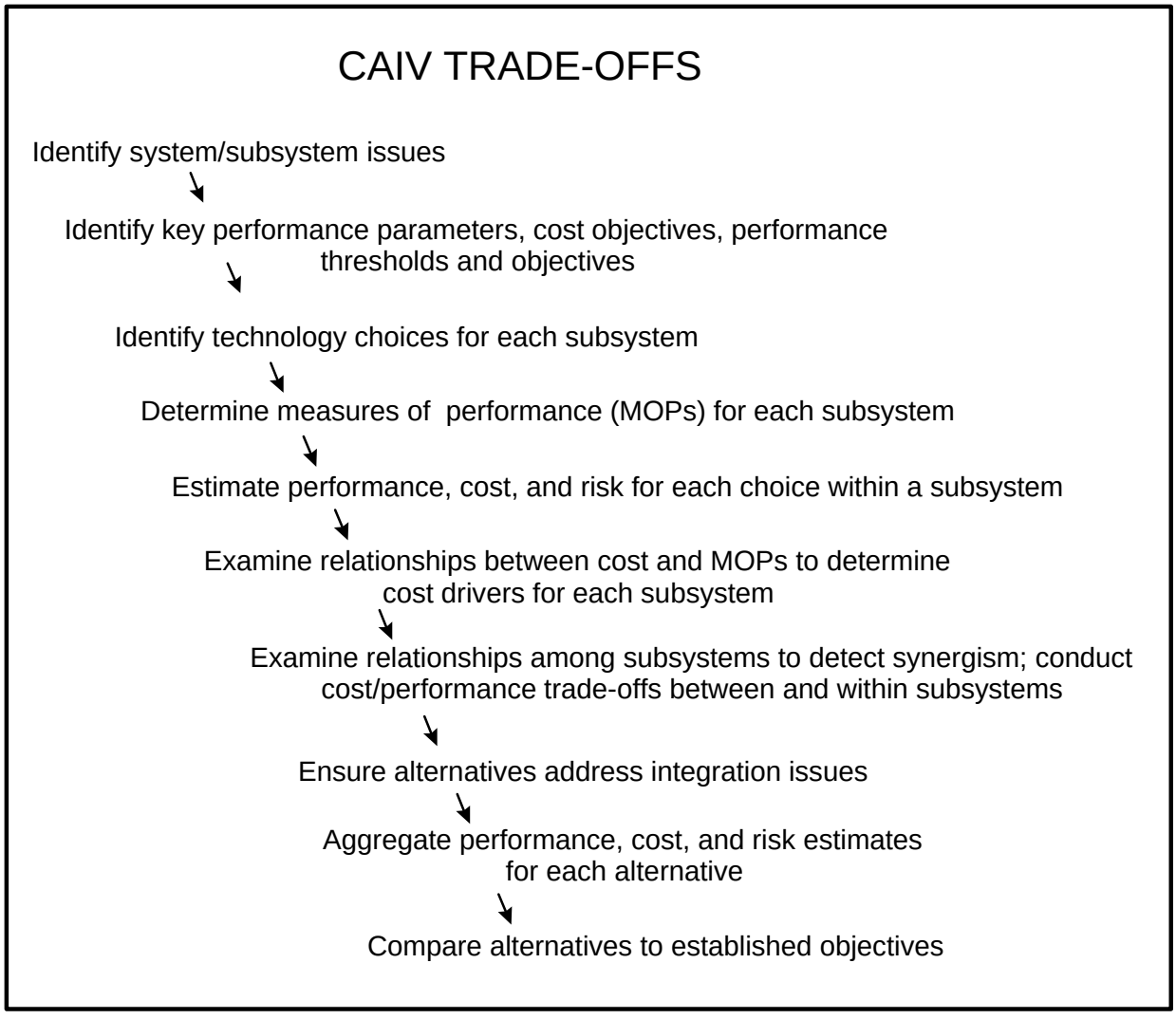


Figure 4.7 CAIV Methodology

Test and Evaluation Master Plan

The test and evaluation master plan (TEMP) documents the overall structure, objectives, and test and evaluation strategy of the program. Both developmental and operational testers should be involved early to ensure that the test program for the most promising alternative(s) can support the acquisition strategy and to ensure that the objectives, thresholds, and MOEs in the ORD and TEMP are in harmony. Quantitative test criteria should be designed to provide substantive evidence of hardware, software, and system maturity, and evidence of the system's readiness to proceed to the next phase of the acquisition process. The various MOEs and MOPs used in the AoA and the TEMP should be linked. In addition the objectives and thresholds in the AoA, ORD, TEMP, APB, and the specification should be linked. (See Figure 4-8, *Parameter Consistency Among Key Documents*.)

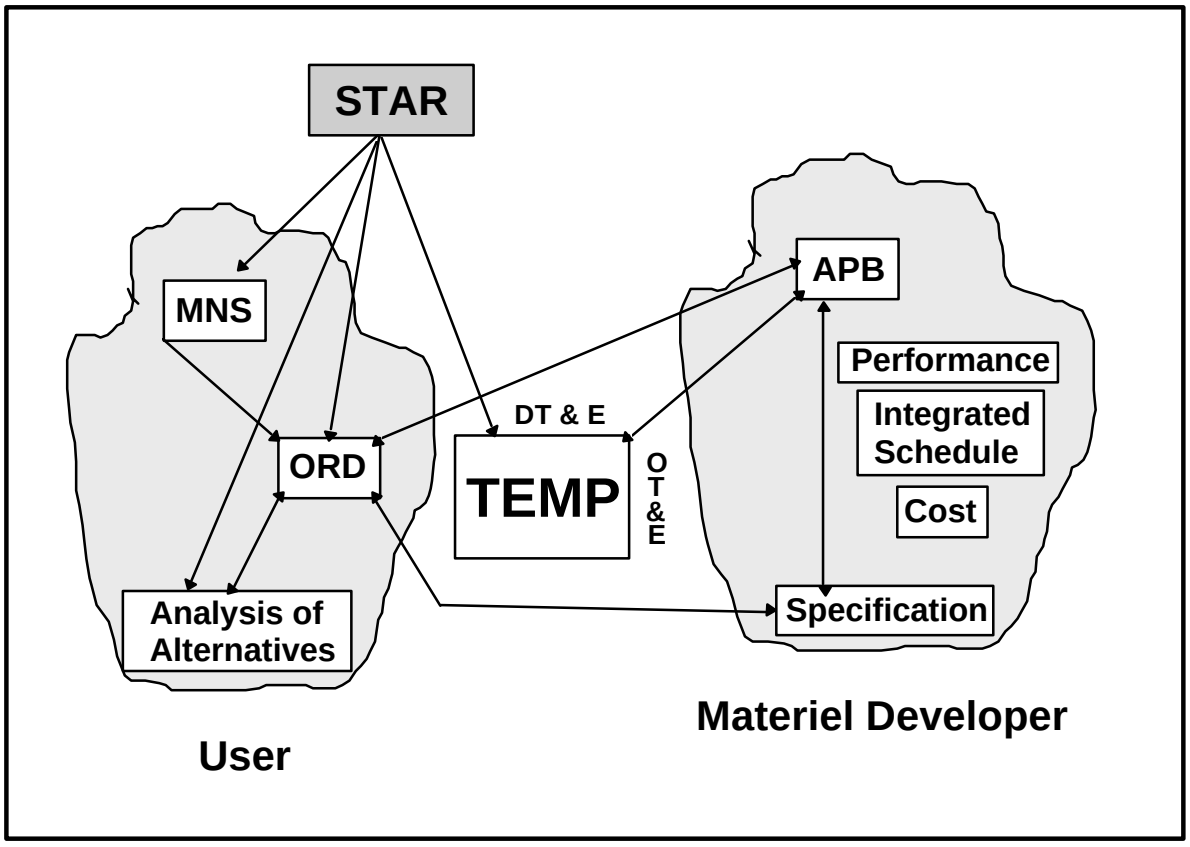


Figure 4-8 Parameter Consistency Among Key Documents

CONTRACTUAL REQUIREMENTS

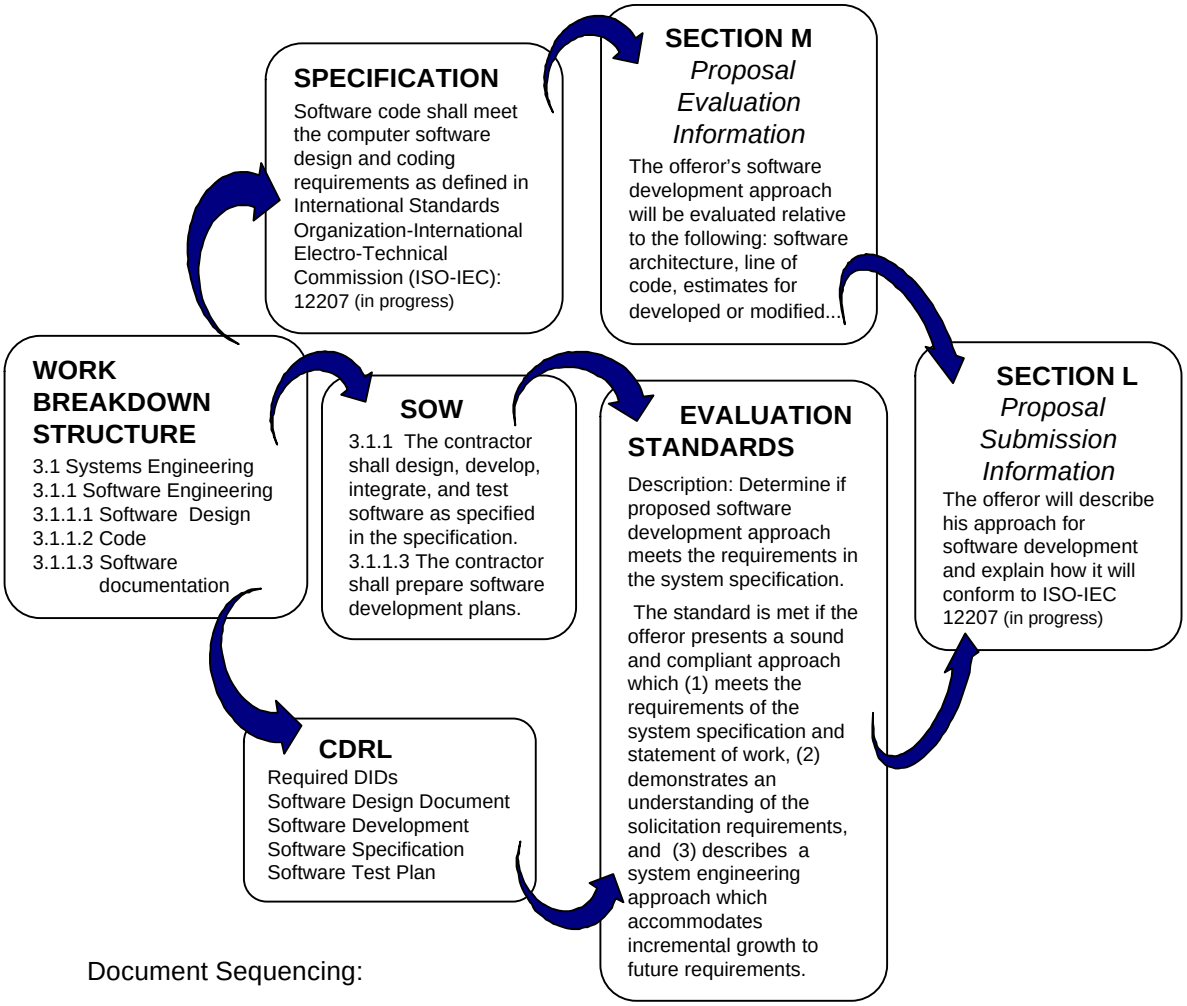
Performance specifications have utility throughout the full spectrum of the acquisition cycle. In concept exploration, where there are many unknowns, they expedite obtaining the widest possible range of inputs from industry. In Product Definition and Risk Reduction (Phase I), they provide the parameters within which contractors have trade space among different performance, cost, and schedule variables. During, Engineering and Manufacturing Development (Phase II), they keep the high level objectives visible during system engineering and CAIV trade-off decisions.

Congruity must exist between Section L and Section M of the solicitation, the Statement of Work, any CDRLs, and the performance specification. Requirements must be stated in Section C. The competitive evaluation scheme described in Section M should (generally) relate only to the contract requirements of Section C. Section L must identify all proposal information required to effect Section M evaluation of how the offeror proposes to effect Section C required work. Section L should not require extraneous material.

Section L directs all offerors to propose approaches that respond to the requirements that appear in the performance specification and the SOW. The bottom line is that offerors are responsible for a design.

The initial performance specification—the one proposed by the winning contractor—evolves into a system specification and ultimately into a product specification. The final document will be the basis for any additional solicitation. (See the process flow illustrated in Figure 4-9, *SOW Information Flow*.)

Sample software development approach:



Document Sequencing:

Work Breakdown Structure (WBS) → Specification, Statement of Work (SOW), Contract Data Requirements List (CDRL) → Section M and Evaluation Standards → Section L

Preparing documents at the appropriate point in time and reviewing them for consistency and completeness are the building blocks leading to a quality RFP document, successful source selection, and ultimately a high-quality end product.

Figure 4-9 SOW Information Flow

AN ITERATIVE PROCESS

All of these processes should occur, and the documentation be developed, as concurrently as possible. The output will be an approved ORD, the appropriate sections for a draft RFP, and the necessary exit criteria for the next milestone decision. After the next milestone the process will be repeated beginning with validation and approval of the ORD.

Note that ideally the next milestone decision will probably be a MS I/III (commercial or nondevelopmental item with no modification or with minor modification) or MS I/II (commercial or nondevelopmental item with major modification). A completely new development (lowest on the acquisition hierarchy of alternatives) would follow a more traditional life cycle process.

THE BUDGET PROCESS

The budget process is separate from, but very important to, the requirements generation process. Initiation of a new start must begin early. Acquisition planning should begin as soon as the need is identified—well in advance of the fiscal year in which contract award is contemplated.

Without proper funding for concept exploration, the program manager will have difficulty performing a full AoA and soliciting alternative system concepts from industry—but the concept exploration phase has the greatest potential to allow free and open competition of ideas. Without industry involvement, the government is limited to developing its own notional alternatives, an approach which limits new ideas. This limited approach to meeting the need greatly influences the evolution of requirements downstream.

Neither government or industry is likely to devote resources until there is some assurance that funds will be available. Solicitations are unlikely to be released until DoD knows with some confidence that funds will be included in the budget, and that the time required for solicitation preparation, proposal preparation, source evaluation, and contract award can be generalized as around nine months.

Figure 4-10, *New Start Planning*, shows that the budget process leads the acquisition process by almost two years. Thus in this example, if the first funding is available in early Fiscal Year 2000 (October or November 1999), contract award would not be likely until about mid Calendar Year 2000.

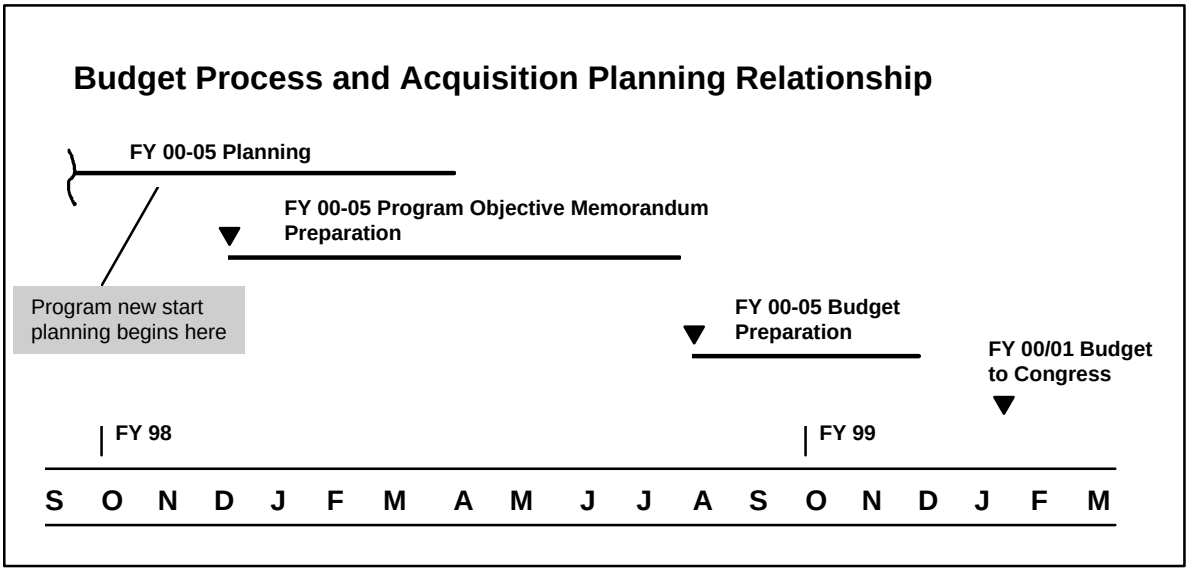


Figure 4-10 New Start Planning

Chapter 5:

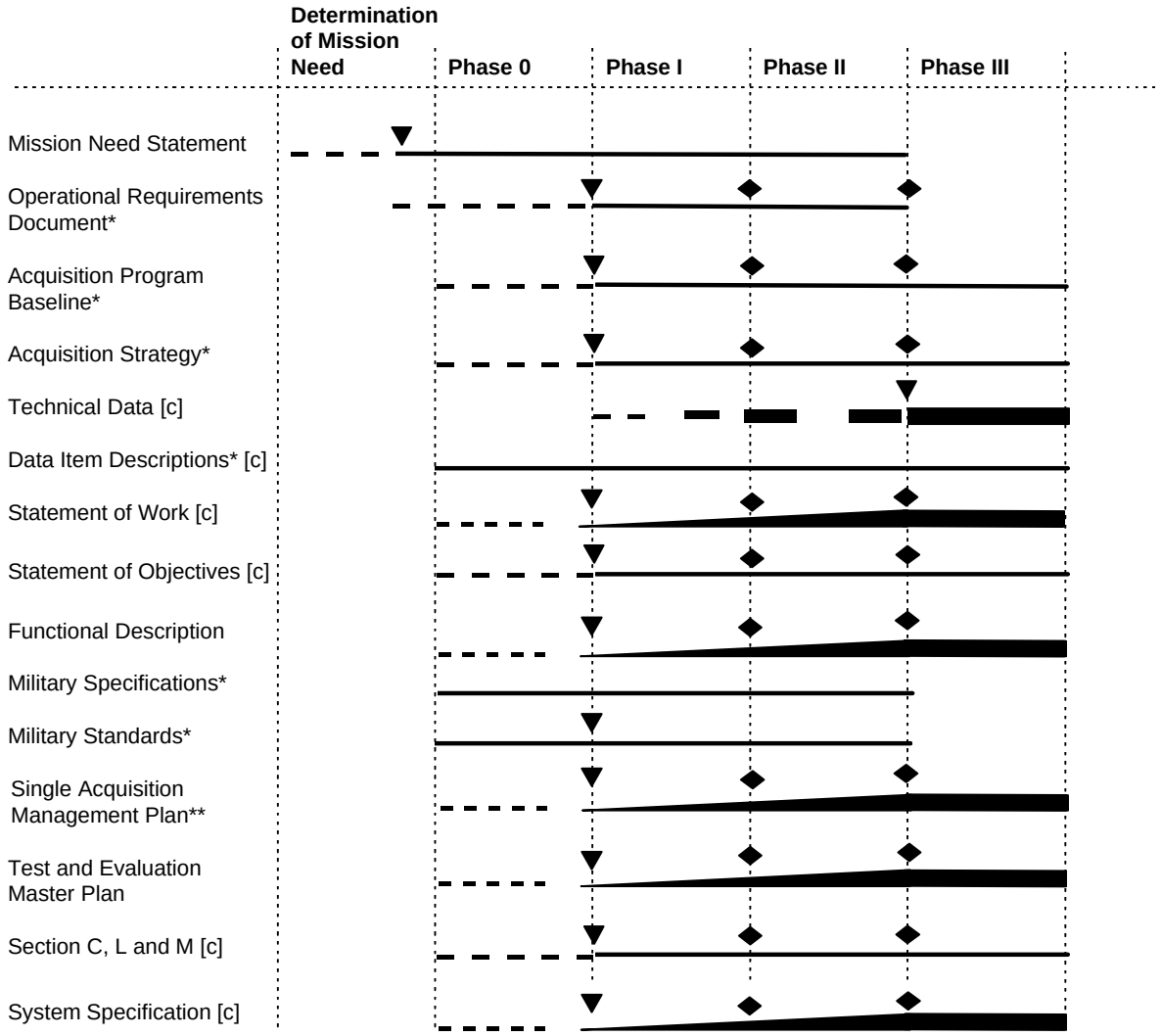
The Evolution of Requirements

COMPARISON OF REQUIREMENTS

Most requirements documents evolve as the system or program they document moves through the acquisition life cycle. Some evolve more rapidly then others; some mature and become more detailed more quickly than others. Different documents have more or less prominence at different points in the acquisition life cycle. On the other hand, some documents do not change once they are approved.

Figure 5-1, *Requirements Evolution*, provides a graphical comparison of the evolution of a particular requirement during a system's life cycle. The figure illustrates two general categories of requirements: 1) requirements that never change once they are developed and 2) requirements that grow more complex and detailed as a program matures.

Documents followed by a [c] are contract specific rather than program related. These documents would be different for each contract during the life of a program, although they would conform to the overall program plan and objectives. An asterisk indicates that the document is validated and updated only as necessary after Milestone I approval. A double asterisk indicates "or equivalent" because some services use a "SAMP-like" document with a different name. This figure generally apples to all acquisitions, although the evolution of requirements would be much more rapid during the acquisition of a commercial product or service.



* validate and update only as necessary after Milestone I approval

** or equivalent

Legend:

Document Development:

Document Use:
(note: increased thickness of line indicates increased detail of document)

Approval or Acceptance:

Document Update:

Figure 5-1 Requirements Evolution

MISSION NEED STATEMENT

The requirements in the Mission Need Statement are refined at successive milestone decision points as a consequence of the cost, schedule, and performance tradeoffs made during each phase of the acquisition process. As requirements are refined, the following key concepts are adhered to:

- All reasonable options are kept open and tradeoffs are facilitated throughout the acquisition process.
- Early commitments to system-specific solutions are avoided, including early commitments to solutions that inhibit future insertion of commercial off-the-shelf equipment or components.
- Requirements are defined in broad operational capability terms. Minimum acceptable operation performance thresholds are used to establish operational test criteria.

Analyses and experiments assess known and approved programs and technology opportunities such as science and technology objectives, advance technology demonstrations, and advance concept technology demonstrations. These analyses must reflect a consolidated assessment of all mission needs (including near-term, programmed, and future capabilities needed to execute national military strategy.)

OPERATIONAL REQUIREMENTS DOCUMENT

As early as possible the ORD should address:

Maintenance planning

Support equipment

- Unique facility, shelter, or environmental compliance requirements
- Provisioning strategy
- Special packaging, handling and transportation considerations
- Technical data requirements

For commercial or nondevelopmental items, these issues should be addressed initially.

The Operational Requirements Document is updated as necessary based on tradeoff analysis and the challenging of requirements. The document generally becomes more detailed as the program matures.

By Phase II the performance requirements stipulated should fully describe the operational, support, testing, and manpower requirements expected of the system. At this stage of system maturation, the following issues are addressed in the ORD (in addition to the performance thresholds and parameters established in the previous phases):

- **Procedural and technical interfaces**. Those required to be incorporated to ensure interoperability with other Service, Joint Service, and Allied systems are identified.
- **Support objectives for initial and full operational capability**.
- **Computer resources.**
- **Training requirements**. Where applicable, the ORD should also describe the training devices, simulators, embedded training, and

training logistics (e.g., requirements for new or existing training facilities) necessary to support the training concept. This section of the ORD should also include applicable operational requirements for embedded training, training requirements to meet the initial operational capability (IOC), and delivery dates for training devices to ensure the IOC.

- **Human systems integration and personnel requirements.** As plans for the system evolve and more information is available, the ORD should be updated to include more specific manpower requirements. Objectives and thresholds should be consistent with the original manpower constraints and reflect the integration of program interests. Factors such as equipment usage rates, pilot-to-seat ratios, crew size, and maintenance ratios are typically used by the manpower community to determine manpower requirements.

ACQUISITION PROGRAM BASELINE

When approved, the Acquisition Program Baseline serves as the corporate commitment of the program manager and the chain of command to the program, documents the expected program performance, and establishes the "trade space" available to the program management team. By extension the APB also influences the cost, schedule, and performance boundaries within which the contractor must operate. These boundaries may be narrower that those the government management team has been given; they certainly will not be broader. In Phase I the APB is limited in detail and should allow the program as much latitude as possible.

During phases I through III the APB will be updated to reflect the following developments:

- Cooperative support and development opportunities will be refined as they apply to system operation and support in the field.
- The user and developing activities will verify that adequate resources have been programmed to support production, deployment, and logistics support.
- Cost, schedule, performance objectives and thresholds will be developed and approved by the MDA.
- Compliance with international arms agreements will be verified.
- The affordability assessment will be updated.

ACQUISITION STRATEGY

The acquisition strategy establishes the framework within which detailed acquisition planning and program execution are accomplished. It describes how the government will acquire a major system, and, once approved, it should reflect the approving authority's decisions on all major aspects of the contemplated acquisition. The ORD describes what we need to buy; the AoA identifies the preferred concepts addressing what we need to buy; and the acquisition strategy describes how we will buy it. For example, the Phase I strategy may be to verify product performance through a “fly-off” of two competing designs. Once the government has initiated that strategy, the strategy will not change except in response to a major restructuring of the program.

However the Acquisition Strategy document will be updated as the program progresses. Driving this modification will be:

- Refined estimates for cost as an independent variable (CAIV) objective in the APB.
- Assessments of the technology and industrial bases to ensure that the identified system performance can be achieved affordably.

Insertion points for commercial technology can be identified and included in the Acquisition Strategy and life cycle support plans.

TECHNICAL DATA

Technical data is used to support a program’s production, support, and engineering activities. Therefore, in the early phases of an acquisition program the amount of technical data generated is relatively small. Production and support are usually several years away (unless the acquisition is for a commercial or nondevelopmental item), and the engineering effort is just beginning to grow. On the other hand, the availability, cost, and utility of technical data must be addressed in detail early in the program to ensure that the necessary data will be available for the production and support of the product.

If the program is a commercial or nondevelopmental item acquisition, the next milestone might well be a production decision. In this situation any technical data requirements must be identified early in the program. Of course, for this type of acquisition the data requirements should be minimal.

As the program approaches production, the technical data package should address all the system requirements. Developmental and operational testing must confirm that the contractor's design met the system requirements. The final milestone for most programs is a confirmation that the item meets all the specified design requirements (through the test program) and the system design was correctly documented in the final data package. The technical data package is the primary product from the development phase. It defines the product for the production phase.

DATA ITEM DESCRIPTIONS

DIDs and CDRLs

CDRLs list data delivery requirements under a contract, and those requirements would definitely be expected to change from contract to contract as a program matures.

DIDs simply provide a detailed description of the requirement contained in the CDRL.

While the number of DIDs used in a program increases as the program matures, the DIDs themselves do not change in response to the acquisition life cycle. Different DIDs may be called out depending on the type of data needed for each contract. Throughout the process, however, the government should minimize or eliminate requiring data in a specified format.

DIDs are used for all data that requires approval and delivery. Data that can be obtained from other sources (IPT, etc.) and data that would not affect the contract by non-delivery are not contractually required, and DIDs are not required for this data. Minimum essential data is specified in the initial RFP (including the DID numbers) and the resulting contract should reflect both the government's needs and additional data identified by the contractor during source selection. Data that the government wants to formally approve and/or receive should be included in the contract through the use of DIDs. Suggested essential items might include conference minutes, final test reports, and technical data packages.

STATEMENT OF WORK

As with Statements of Objectives below, a program's Statements of Work change at each contract and at each phase of a program's life to meet the particular objectives of that phase. In the early phases, the program becomes defined as one or more concepts, designs, and/or technologies are investigated. Early development models, demonstrations, and operational assessments are conducted as required to reduce risks prior to entering the next phase. Cost, schedule and performance trade-offs are conducted. The SOWs for the program definition phase should contain enough detail—without prescribing how to do the work—to enable the successful bidder to translate program requirements into an effective development program and begin the evolution of system requirements into system specifications or system segment specifications.

In any phase just prior to production the SOW is focused on confirming that the item meets all the specified design requirements (through the test program) and the system design was correctly documented in the final data package.

STATEMENT OF OBJECTIVES

In Phase 0 the SOO should address studies necessary to define the future system's design and support further development. The contractor should be encouraged to use his own approaches and concept studies.

In Phase I the SOO seeks to validate the concept established and confirm that the technologies and design issues are acceptable for further development. The products for this phase are a basic system architecture and preliminary system specifications. The SOO should establish performance objectives and identify the basic system requirements and desired products. The methods used to establish tasking are left to the contractor.

The principal product of Phase II is a final design that will go into production. Although most of the system elements are defined at this point, the SOO should allow the contractor the flexibility to refine the architecture and develop testing programs to fit his engineering concepts. This approach will let contractors tailor their proposals to fit their operational and management concepts. It will generate a wider variety of proposal concepts for review during the source selection.

The product of Phase III is a manufactured and fielded system, ready for operational use. In Phase III the primary concerns are the building, testing, and delivery of the systems. The SOO should identify management areas but leave the selection of the process to the individual contractors. Source selection will focus on cost and effectiveness of the management process.

FUNCTIONAL DESCRIPTION

The initial functional description is approved after the initial ORD is approved at Milestone I. A functional description is a follow-on to the ORD to specifically address requirements related to information technology. As such, it changes throughout a system's life cycle as requirements related to information technology change in the ORD. The functional description is a vehicle of communication between the user community and the developer community to ensure agreement on the complex computer resource concepts. It is not a design directive. It is a design influence.

The functional description amplifies requirements approved in the ORD and tracks system initialization documents e.g., System Decision Paper, MNS, and Operational Mode Summary/Mission Profile. Writing a functional description is not a trivial task, and the type of system will affect the level of detail required. For example, a functional description for a C3I system will require more detailed operational information than a functional description for a munition communicating its course to a guidance system. All the information described below may appear in a functional description, but it is more important that the user address the higher tiers well, than all tiers poorly.

- Describe operational requirements in natural language.
- Describe operational requirements using a formal logic, e.g., object-oriented analysis.
- Describe operational requirements using formal notation.
- Conduct business process reengineering analysis of the system's mission area and relate it to the operational requirements for this system.
- Describe information requirements to support operational requirements, analyzed to the data element level.

MILITARY SPECIFICATIONS AND STANDARDS

As with DIDs, specifications and standards do not change in response to the acquisition cycle. As a program matures, the number of specifications needed to delineate an increasingly complex system, e.g., interface requirements, may increase, but the specifications themselves do not change.

SINGLE ACQUISITION MANAGEMENT PLAN

The Single Acquisition Management Plan, or equivalent, is intended to provide the decision maker with the opportunity to approve a program's direction as described in its acquisition strategy. Like the Acquisition Strategy, the SAMP is not likely to undergo major changes throughout a program's life cycle, but it will be updated as the program progresses.

TEST AND EVALUATION MASTER PLAN

The test and evaluation master plan documents the overall structure, objectives, and the test and evaluation strategy of the program. Both

developmental and operational testers should be involved early to ensure that the test program for the most promising alternative can support the acquisition strategy and to ensure that objectives, threshold, and MOEs in the ORD and TEMP are harmonized. Quantitative criteria should be phased to provide substantive evidence for analysis of hardware, software, and system maturity and readiness.

Like the Acquisition Strategy, the Test and Evaluation Master Plan will be updated as the program progresses. These updates could include:

- Added tests to address unanticipated issues that have arisen as the system matures.
- Eliminated tests that address issues that have been resolved through other means.
- Other changes that reflect changes in the user's requirement, or the acquisition strategy.

SECTIONS C, L & M OF CONTRACT

Like the SOW and the SOO, Sections C, L & M change at each phase of a program's life to meet the particular objectives of that phase.

SYSTEM SPECIFICATION

In the early phases of a program the system specification generally lacks detail so that development teams will have the latitude to pursue widely varying alternatives. These teams are in parallel developing their systems' high level performance specifications. These top level specifications enable the contractor to flow down performance parameters to the subsystems and allow development of proposals in the next phase's competitions.

As the program matures the detail of the system specification is increased as tradeoffs are made and the system is better defined.

Appendix A:

Examples of Statements of Objectives

Statement of Objectives
T-38 Avionics Upgrade Program (AUP)

PROGRAM GOAL: Upgrade and support T-38 aircraft avionics and Aircrew Training Devices (ATDs) to provide pilots with the essential avionics and cockpit management skills necessary for transition to follow-on Fighter and Bomber aircraft in the first half of the 21st century and to support the vision of AETC Mission Ready training.

OBJECTIVES: Define and manage an Acquisition Program that meets the following objectives.

- Provide an upgraded avionics system and related cockpit functions to provide supportable, cost effective training for the Bomber-Fighter Track tasks of Specialized Undergraduate Pilot Training.
- Provide expandability and flexibility that permits future growth of the system
- Permit compatibility with National Airspace System (NAS) Requirements
- Provide capabilities for training advanced cockpit management and head-up flying skills to support transition to follow-on Major Weapon System aircraft
- Provide upgraded Aircrew Training Devices as a companion element to T-38 Training.
- Provide Operational Flight Trainers (OFTs) and Unit Training Devices (UTDs) that will replicate the aircraft AUP modifications and their operation for simulator training
- Improve the Reliability, Maintainability, Availability and Supportability of ATDs
- Expand the ATD visual system capability to permit training new tasks and improve training fidelity
- Provide Contractor Logistics Support (CLS) for the T-38 AUP aircraft and ATDs.
- Establish contractor issue and repair of AUP aircraft components
- Establish contractor management and maintenance of ATDs
- Define and manage a flexible, executable acquisition program that takes full advantage of acquisition streamlining and reform.
- Manage program activities to implement Integrated Product Development (IPD)
- Utilize government “insight into” versus “oversight of” contractor activities
- Foster full consideration of Non-Developmental Items (NDIs)
- Use best value source selection criteria with emphasis on past performance to provide cost effective development, production, operations, and support.

JOINT AIR TO SURFACE STANDOFF MISSILE (JASSM) PROGRAM
STATEMENT OF OBJECTIVES

25 Mar 1996

The Air Force and Navy warfighters need a standoff missile that will destroy the enemies' war-sustaining capabilities with a launch standoff range outside the range of enemy area defenses. Offerors shall use the following objectives for the PDRR and EMD acquisition phases of the JASSM program along with other applicable portions of the RFP when preparing proposals and program documentation. IMP and IMS events shall be traceable to the Statement of Objectives and the System Performance Specification.

PDRR OBJECTIVES

a. Demonstrate through test, analysis and/or simulation the viability of the JASSM system concept. Performance shall be at the contractor developed System Performance Specification (SPS) requirements level determined during PDRR.

b. Demonstrate the best overall value to satisfy the Government's need, balancing cost, performance and other factors.

c. Demonstrate that both the system design and the critical manufacturing processes are sufficiently low risk to enter EMD.

d. Demonstrate the ability to deliver an affordable, producible and supportable system at or under the average unit procurement price (AUPP) threshold requirement.

e. Provide a JASSM system review including final system design, requirements tradeoffs with supporting data including cost; technical and manufacturing accomplishments; results of subsystem demonstrations, tests and analyses; remaining technical and manufacturing risks; and major tasks to be accomplished in EMD.

EMD OBJECTIVES

a. Demonstrate through test and/or analysis that all requirements as stated in the System Performance Specification are met.

b. Continue to demonstrate ability to deliver an affordable, producible and supportable system at or under the AUPP threshold requirement.

c. Produce production representative system for operational test and evaluation, including combined Contractor-Conducted Developmental Test and Evaluation/Operational Test and Evaluation (CDT/OT) and dedicated Initial Operational Test and Evaluation (IOT&E) on the F-16C/D and B-52H aircraft.

d. Demonstrate military utility (operational effectiveness and suitability) to support a low rate initial production decision in early 2nd quarter FY00 and a full rate production decision in early 3rd quarter FY01.

e. Produce thirty-five (35) production prove-out units to demonstrate all production processes and to support a required assets availability date of late 3rd quarter FY01.

Appendix B:

Acquisition Case Study

HYPOTHETICAL ACQUISITION CASE STUDY

INITIAL MISSION NEED

Amphibious assault from an Amphibious Area of Operations (AOA) exposes assault force ships to attack from land-launched cruise missiles. The organic weapon system's reaction time may be inadequate to defeat late detected missiles.

CONCEPT VALIDATION PHASE

Activities during this phase

The Overarching Integrated Product Team (OIPT) formed (consisting of Navy, Marine Corps, Army, and industry participants) to address the problem identified five possible candidate approaches that could correct the identified deficiency. These were:

- **Upgrade capability of Unmanned Ariel Vehicle (UAV) to provide visual and infrared surveillance of the AOA**. Data would be relayed back to the command and control ship via data link. This solution would be a joint effort using the existing UAV as the baseline. The IPT selected this concept for further development at Milestone I.
- **Reconfigure existing naval sonobuoys to detect airborne noise and use sonobuoy barriers to detect cruise missile excursions into the AOA.** Because this concept used proven technology that would require sensor and algorithm modifications, the IPT selected it for further development at Milestone I. It also seemed a good candidate for commercial technology insertion.
- **Provide constant on station AEWS surveillance.** This approach would involve non-material solutions to the problem. However, available resources could be too limited in the event of large scale hostile operations on multiple fronts. While this was the lowest cost approach to

the problem, the IPT deemed mission risk due to non-availability of assets a fatal flaw.

- **Improve shipboard radar capability for processing low profile targets in a high clutter environment.** This option was rejected by the IPT because it was too time consuming and would involve significant hardware and software development. While the improvements were amenable to extensive insertion of commercial technology, the dynamics of the commercial market (the high cost of upgrades due to commercial technology market changes) coupled with the extensive integration of systems that would be required, made this approach unfeasible.

Document actions during this phase

MNS - validated by JROC.

ORD - established the requirement for a system to "detect a land launched cruise missile attack in sufficient time for the incoming raid of XXX missiles to be defeated by Amphibious Assault Force escorting combatants consisting of AEGIS cruisers and destroyers."

APB - established CAIV initial targets for R&D and production and deployment. A four year development time was established.

SOW - reflected study to determine concept satisfying the ORD requirements.

System Specification - none.

Acquisition Strategy - Up to two concepts would be selected for development and proof of concept. These would be competitively awarded after a Milestone I decision to proceed.

NEW PROGRAM DEVELOPMENT PHASE

Activities during this phase

The UAV concept was modeled and prototyped by a competitively awarded industry contract. This approach proved to be costly because of high unit costs and high life cycle costs for UAV maintenance. While the telemetry and sensor technology was greatly enhanced through use of commercial technology, hardening the equipment to survive the intense radio frequency (RF) environment of the battlefield proved to be too stressful for the UAV airframe.

The sonobuoy concept was explored by a joint Navy lab and private industry team. Commercially available acoustic filters easily adapted to detection of airborne noise. Data linking to command and control

ships proved to be difficult due to line of sight limitations of the buoy UHF transmitters. Integration with UAV data relays is a possible solution. Since only a single UAV is required, and no sensor packages required, the IPT considered this approach a superior solution to the pure UAV approach.

Document updates during this phase

MNS - validated as still current.

ORD - updated to reflect requirement for:

- waterborne acoustic sensing of cruise missile noise.
- processing noise data to identify target position and velocity.
- generating XXX seconds of reaction time to missile firing ships defending an amphibious assault force.
- key performance factor of detection time of XXX seconds before impact on an AOA ship. Minimum performance established is YYY seconds.

APB - CAIV updated to reflect a target unit cost for individual sonobuoys, data link systems, and sensor algorithms. Cost thresholds established. Schedule for development reduced to 2 years. Availability of program requirements for the next phase validated.

SOW/SOO - reflected ORD statements and requirements for EMD activities. Data documentation for computer program documentation deliverable established. No military specifications or standards called out. Next contracting phase will refine technology and integration and prepare final system specification.

Acquisition Strategy - existing sonobuoy assets will be used and orders for new assets placed with the Navy inventory manager for sonobuoys. Upgrades installing noise filters will be competitively awarded. Commercially available filters will be used. Commercially available ultra high frequency (UHF) transmitters for data links will be used. Government furnished equipment (GFE) for encryption of data will be provided to the integrator. No changes needed to the UAV data transfer elements. Out year Program Objective Memorandum (POM) requirements established.

System Specification - updated to reflect ORD requirements for waterborne acoustic sensor. Maximum sea state, RF background noise, ECM hardening, time on station deployment lifetime established.

TEMP - DT/OT requirements established and coordinated with the user. Verification methods established. Verification resource requirements identified.

ENGINEERING AND MANUFACTURING DEVELOPMENT PHASE

Activities completed during this phase

The industrial partner executing the previous phase executed a contract option to complete the system integration and define the final system performance specification. The following activities were completed:

Integration of the total system architecture including sonobuoy, UAV data link, and shipboard processing (which includes target velocity and position data transmission to the cooperative engagement system) was completed and interfaces specified.

The Navy partner identified the commercial market base and market dynamics that would drive the life cycle maintenance philosophy.

Developmental testing (DT) was completed and the IPT recommended a low rate initial production (LRIP) to satisfy final operational testing (OT).

Environmental studies were completed. The only problem noted was possible environmental contamination from the battery powering the sonobuoy. Because the buoy is designed to sink at end of life (in this case in relatively shallow water), the battery compartment was sealed to prevent any leakage into the water. The IPT also noted that any possible environmental damage resulting from battery leakage was trivial relative to the damage expected from combat operations.

Cost studies were completed and the affordability assessment updated. The system was well within the CAIV parameters.

Document updates

MNS - validated as still a current deficiency.

ORD - Updated to reflect the following additional performance parameters:

- Sea state, salinity, wind blown sand, operating environment.
- No maintenance storage aboard amphibious vessels.
- Deployed from airborne helicopter with forward velocity not exceeding 100 knots and altitude not exceeding 150 feet above water (by radar altimeter).
- Interface capability with UAV data link type YYY.

- Provide secure communications to command relays.
- Operate continuously while deployed for 12 hours.
- Isolate and report noise spectrum given by classified threat document.

APB - Updated to reflect the following:

- life cycle cost revised. (Revision lower than figure in original concept.)
- Delivery schedules and quantities defined.
- Production resource programming verified.
- LRIP decision to support OT verification.

Acquisition Strategy - updated to reflect the following:

- Potential industrial base for commercial components based on market surveys completed.
- Competitive integration for final product on firm fixed price (FFP) basis.
- Out year funding requirements.

System Specification - updated to include the following:

- Interface specifications.
- Updated ORD requirements.
- Environmental controls for battery compartment.
- Frequency agility with UHF band.
- Crypto interfaces standards.
- Threat noise spectrum definition (classified document).
- Institute of Electrical and Electronics Engineers (IEEE) standards for soldering of electronic components.
- American Society for Testing and Materials (ASTM) standards for impact testing simulating airborne launch.
- Software timing requirements and software interfaces with CEC.

TEMP - updated for OT testing of an LRIP quantity of 35 sonobuoys with a single UAV relay vehicle. Will be tested during an amphibious exercise held off the coast of Camp Pendleton, CA (after the brush fire is extinguished).

Appendix C:

Sample Statement of Work

STATEMENT OF WORK

FOR THE

OPPOSING-FORCES MAIN BATTLE TANK

(OPFOR MBT)

PROGRAM

Doc No. AMSTI-W-031

prepared by

DIRECTORATE FOR RESEARCH AND ENGINEERING

VIRTUAL SIMULATIONS SYSTEMS DIVISION

SIMULATION, TRAINING AND INSTRUMENTATION COMMAND

9 September 1997

Statement of Work
for the
Opposing-Forces Main Battle Tank (OPFOR MBT)

Table of Contents

Statement of Work

for the

Opposing-Forces Main Battle Tank (OPFOR MBT)

1. SCOPE This Statement of Work (SOW) defines the effort required for the modification, fabrication, verification and production of an Opposing-Forces Main Battle Tank (OPFOR MBT). It includes the associated program management, human engineering, safety, and logistic support planning requirements.

2. APPLICABLE DOCUMENTS The following documents are applicable to this Statement of Work and attached appendices to the extent specified herein.

2.1 OTHER GOVERNMENT DOCUMENTS, DRAWINGS, AND PUBLICATIONS

PRF PT-00011 System Requirement Document (SRD) for the OPFOR MBT

(Unless otherwise specified, copies of other Government documents, drawings, and publications are available through the Procuring Contracting Officer (PCO).)

3. REQUIREMENTS

3.1 General: The contractor shall provide the necessary resources, equipment, and facilities to modify, fabricate, verify, and deliver vehicle systems that meet the performance criteria specified in the SRD. The contractor shall provide the Government access to all data developed and used in performance of the required work. The contractor shall also provide program management, logistic support planning, data, and configuration management.

3.2 Detail Tasks:

3.2.1 Engineering, Fabrication and Verification:

3.2.1.1 Production. The contractor shall implement a manufacturing management process that addresses, as a minimum, resource analysis, production readiness, risk analysis, manufacturing strategy, producibility engineering, integration with the quality system, production planning, scheduling, and cost estimating. A production readiness assessment (PRA) will be conducted by the Government at the contractor's facility, concurrent with

scheduled working group meetings. The contractor shall address or correct any characteristics or deficiencies that are found to inhibit or make continuation of production a high risk.

3.2.1.2 Crew Interoperability. The contractor shall plan, implement, review, verify, and document program efforts to ensure that human engineering, manpower, personnel, training, safety, health hazards, and soldier survivability aspects are integrated with the OPFOR MBT system configuration. Efforts shall ensure that target audience personnel can be trained to safely perform human-equipment interface tasks to meet system operational, maintenance, and support requirements. The contractor shall perform user and machine analyses and trade studies to include trade-offs among the hardware, software, skill levels, safety, training, personnel, and life cycle costs; ensure manpower, personnel training and logistics support information is derived from early human engineering analysis; and verify that trained personnel can safely and effectively operate, maintain and control the system in its intended operational environment.

3.2.1.3 Verification. The contractor shall demonstrate, provide data, or conduct all assessments and tests necessary to assure that the OPFOR MBT system is in full compliance with the SRD. Verification tests may be conducted at the contractor's facilities, at an independent laboratory, other commercial testing facilities or Government test facilities. Coordination and acquisition of Government test facilities and support shall be the responsibility of the contractor. The contractor shall document all verification, analysis, data and test results.

3.2.1.4 System Safety. The contractor shall have and shall implement a method to ensure the configuration meets the safety requirements of the SRD. The methodology or processes used shall include means to identify hazards, assess the risk associated with identified hazards, track hazards, mitigate or correct hazards, test and verify that corrective actions have been implemented and hazards have been minimized, and request waivers from the Government for any feature that does not meet the safety requirements of the SRD.

3.2.1.5 System Safety Working Group (SSWG). The contractor shall participate as an active member of the Opposing Forces Surrogate Vehicle program SSWG. The SSWG will meet no more than 60 days after contract award and every six months thereafter (or other interval as decided by the SSWG). The contractor shall participate in two SSWG meetings at Government facilities. Contractor participation includes activities such as:

- Presenting the contractor safety program status, including results of performance or operational risk assessments.
- Presenting a summary of hazards identified and analyses conducted.
- Developing, validating, or identifying system safety or testing deficiencies/requirements.

3.2.1.6 Hazardous Materials. The contractor shall ensure that the system configuration eliminates or minimizes the use and generation of hazardous materials and hazardous wastes (HM/HW) during the manufacture, test, operation, maintenance, and disposal of the system.

3.2.1.7 Pollution Prevention. The contractor shall ensure that the system configuration eliminates or minimizes the generation of all types of pollution during the manufacture, test, operation, and disposal of the system.

3.2.2 Program Planning:

3.2.2.1 Program Management. The contractor shall establish and maintain a project management program during performance of the contract to include provisions for the technical and administrative planning, organization, coordination, control, resource allocations, risk management, and other efforts as appropriate to accomplish the contractual objectives for the OPFOR MBT acquisition.

a. Integrated Master Plan (IMP). The contractor shall implement, manage to, update, and maintain the contract IMP. The IMP shall show interrelationships between activities and events to the degree necessary for management visibility and control of the program. The contractor shall perform the requirements of this contract in accordance with this IMP. The IMP shall be used throughout the contract as a management tool to assess progress and determine success in achieving program requirements. The contractor shall report on work in progress in accordance with the IMP at each Interface Working Group Meeting (IWGM).

b. Integrated Master Schedule (IMS). The contractor shall implement, manage to, update, and maintain the event driven IMS. All contractor schedule information delivered or presented at IWGMs shall originate from the IMS. The IMS shall be traceable to the IMP and shall contain all critical events, accomplishments, and criteria, predecessors and successors, and their dependencies. The IMS shall address total OPFOR MBT activities for the prime contractor and subcontractors. The contractor shall conduct critical path analyses of the tasks and report problem areas and corrective actions required to eliminate or reduce schedule impact.

3.2.2.2. Conferences and Meetings. The contractor shall conduct or support the following conferences and meetings.

a. Post Award Conference (PAC). The PAC shall be conducted no later than 10 business days after contract award. The contractor shall present, as a minimum, the following information:

- Scheduling system showing program milestones, reviews and conferences, and other requisite events.
- System requirements and plans to satisfy and verify performance.
- Integrated logistics support concepts.
- Program management structure.
- Key personnel and subcontractors and associated responsibilities.

b. Interface Working Group Meetings (IWGM). IWGMs will be held at the contractor's facility on an as needed basis.

3.2.3 Logistics Management: The contractor shall document and implement the technical effort required to ensure the system's configuration considers integrating logistical

support and minimizing Life-Cycle cost. The contractor shall produce and define an optimized support infrastructure for production, delivery, and deployment, and the installation, activation and deployment of the support infrastructure, including that required to sustain initial operations in a timely and economical manner. The contractor shall provide technical and program support needed to sustain the operational system at the required performance requirements and cost objectives. The contractor shall recommend and implement, when authorized, system configuration changes.

3.2.3.1 Reliability. The contractor shall plan, implement, and manage a reliability engineering effort that assures the satisfaction of system objectives and personnel safety. Tasks shall include but not be limited to:

- Identification and control of program risks such as single point failure modes and critical items.
- Ensure sustained product integrity, personnel safety and logistics support information is derived from early reliability engineering analyses such that reliability engineering can be applied to influence the configuration.
- Employ a closed loop corrective action system that uses anomaly data from all available sources and feeds back to the design process.
- Produce proposed reliability requirements verification methods.

3.2.3.2 Maintainability. The contractor shall plan, implement, and manage a maintainability engineering program to insure the conduct of comprehensive disciplined program processes that define, demonstrate, and verify the accomplishment of maintainability goals prior to system deployment. This effort shall measure the mean time to repair, complexity, accessibility, and testability to enhance servicing, preventive maintenance, and diagnostic capabilities of the vehicle system.

3.2.3.3 Maintenance Concept. The contractor shall document the most efficient maintenance concept for the system. The Government anticipates a three level maintenance concept: Unit, Intermediate (Direct Support and General Support) and Depot level. Military personnel will perform maintenance on common chassis and turret components from operator through general support maintenance level. The maintenance concept shall be compatible with that which is available for existing US Army tracked vehicles. The contractor shall validate the proposed maintenance and supply support concepts by conducting a Logistics Demonstration (LD). The contractor shall coordinate the planning for the LD with the Government to allow for the maximum use of Army personnel during the demonstration.

3.2.3.4 Production Baseline. The contractor shall document and control the production baseline using established change control and engineering release processes. This task shall include producing performance and interface characteristics control documents for each peculiar reprocurable spare/repair part, component and assembly in sufficient detail to permit reprocurement. The contractor shall identify components and assemblies to be procured as spare parts for major components and identify any assemblies to be procured independently.

3.2.3.5 Operation, Maintenance and Repair Procedures. The contractor shall prepare and produce the tasks, maintenance allocation levels, and procedures (to include Preventative Maintenance Checks and Services), as required to operate, maintain and repair the MBT. These procedures must be capable of conveying sufficient information (objective is the 8th Grade Reading Level) to military crew members, maintainers, and skilled LCCS technicians to operate, maintain, troubleshoot, and repair the MBT. All such technical information shall be validated by the contractor. The Government shall be notified of the process and schedule so that personnel may be made available to witness the validation efforts.

3.2.4 Training

3.2.4.1 Training Courses. The contractor shall prepare training courses outlining the subject areas, tasks, and objectives required for the operation and maintenance of the system within the defined support concept. The contractor shall present, as New Equipment Training (NET) (in a Train the Trainer concept), all courses as defined for the system at the fielding site.

3.2.4.2 Materials. The contractor shall produce all materials and procedures as needed to enable initial and sustainment training on the operation and maintenance of the system within the established support concept. These materials and procedures must be capable of conveying sufficient information (objective is the 8th Grade Reading Level) to train military crew members, maintainers, and skilled LCCS technicians to operate, maintain, troubleshoot, and repair the MBT. All such training materials shall be validated by the contractor. The Government shall be notified of the validation process and schedule so that personnel may be made available to witness the efforts.

3.2.5 Fielding and Interim Support:

3.2.5.1 Fielding Team. The contractor shall plan for and provide a fielding team to support delivery of systems to the specified site. Support to be performed by the team includes receipt of the vehicle; conduct of a joint equipment inventory of all items with the user (this includes all on board spare and repair parts, tools, and equipment required to place the vehicle in operation, to operate it, and to perform emergency repairs); performance of operational checks; correction of any deficiencies; and transfer of accountability of the system to the Government.

3.2.5.2 Interim Contractor Support (ICS). The contractor shall document, specify the services to be provided, and present to the Government their concept for conducting ICS. The contractor shall determine, plan for, and conduct the full range of ICS (hardware and software) and ICS transition tasks required to support the systems at the fielding site. The plan shall include actions to be performed for ICS start-up, the full range of operation, maintenance, supply support, training, and transition of services to LCCS services. ICS services shall be provided at a level of support that assures a 95% system operational rate.

3.2.5.3 Supply Support. The contractor shall recommend all necessary Test Measurement and Diagnostic Equipment (TMDE), tools and other test equipment required

to support the vehicle system. The contractor shall recommend the full range and depth of spare, repair parts, consumable and expendable components (does not include Petroleum, Oils and Lubricants), required to operate, maintain, repair, and service the MBT for a period of 12 months. The contractor shall provide estimated unit costs for the items identified to allow for procurement under the Provisioned Items Ordering (PIO) contract line item.

3.2.5.4 Long Lead-Time Items Listing. From the list generated in paragraph 3.2.5.3, the contractor shall identify those spares, repair parts, tools (common or special), test equipment, and any other items having an acquisition Lead-Time in excess of six (6) months. This identification shall reflect the number of months necessary to acquire the item.

3.2.6 Support Services: The contractor shall plan for and provide personnel, equipment, and facilities as necessary to support the Government in the evaluation and resolution of identified technical or support issues.

Appendix D:

Outline of an Example Single Acquisition Management Plan

SINGLE ACQUISITION MANAGEMENT PLAN NO. YF-96-01

1. EXECUTIVE SUMMARY

1.1 Information Requirements Summary

2. PROGRAM BACKGROUND

2.1 Statement of Need

2.2 Mission And Description

2.3 Program History

2.4 Program Authority, Priorities, Allocations and Allotments

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2.7 Acquisition Program Baseline (Attachments 3 and 4)

3. RISK ASSESSMENT

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3.1.1 Critical System Characteristics

3.1.2 Risk Areas

3.2 Manufacturing Risk Assessment

3.3 Other

4. TEST AND EVALUATION APPROACH

4.1 Test Program Summary

4.1.1 System Introduction

4.1.2 Integrated Test Program Summary

4.1.3 Management

4.2 Developmental Test and Evaluation Overview

4.2.1 Scope of Testing

5.5.2 System Security Engineering

5.6 Intelligence Support Requirements

5.7 C4ISR Support Plan

6. LONG-RANGE STRATEGIES

6.1 Affordability

6.1.1 Analysis of Alternatives

6.1.2 Cost Information Availability / Cost Confidence

6.1.3 Life Cycle Cost

6.2 Program Manpower Estimates

6.2.1 SPO Manpower Estimates

6.2.2 Human Systems Integration

6.3 Support Concept

6.3.1 Support Objectives

6.3.2 Support Strategy

6.4 Future Updates

6.4.1 Baseline Management

6.5 Foreign Military Sales Implications

7. SUMMARY

Appendix E: Acronyms

ACAT	Acquisition Category
AEWS	Aircraft Engine Warranty Sub-board
AMSDL	Acquisition Management System and Data Requirements Control List
AoA	Analysis of Alternatives
AOA	Area of Operations
APB	Acquisition Program Baseline
ASTM	American Society for Testing and Materials
C^4I	Command, Control, Communication and Computers
CAE	Component Acquisition Executive
CAIV	Cost as an Independent Variable
CARS	Consolidated Acquisition Reporting System
CDRL	Contract Data Requirements List
CINCs	Commanders in Chief
DAE	Defense Acquisition Executive
DIDs	Data Item Descriptions
DoD	Department of Defense
DT	developmental test
ECM	electronic countermeasures
EMD	Engineering and Manufacturing Development
FFP	firm fixed price
GFE	government furnished equipment
HM/HW	hazardous materials/hazardous wastes
ICS	interim contractor support
IEEE	Institute of Electrical and Electronics Engineers
IMP	Integrated Master Plan
IMS	Integrated Master Schedule
IOC	initial operational capability
IPT	Integrated Product Team
IWGM	Interface Working Group Meeting
JROC	Joint Requirements Oversight Council
KPPs	key performance parameters
LCCS	Life Cycle Contractor Support

LD	Logistics Demonstration
LRIP	low rate initial production
MBT	Main Battle Tank
MDA	Milestone Decision Authority
MNS	Mission Need Statement
MOEs	measures of effectiveness
MOPs	measures of performance
NET	new equipment training
OIPT	Overarching Integrated Product Team
OPFOR	opposing forces
ORD	Operational Requirements Document
OSD	Office of the Secretary of Defense
OT	operational test
PAC	Post Award Conference
PCO	Procuring Contracting Officer
PEO	Program Executive Officer
PIO	Provisioned Items Ordering
POM	Program Objective Memorandum
RF	radio frequency
RFP	Request for Proposal
SAMP	Single Acquisition Management Plan
SDR	System Requirements Document
SOO	Statement of Objectives
SOW	Statement of Work
SSWG	System Safety Working Group
STAR	System Threat Analysis Report
T&E	test and evaluation
TEMP	Test and Evaluation Master Plan
TMDE	Test Measurement and Diagnostic Equipment
UAV	Unmanned Aerial Vehicle
UHF	ultra high frequency
WBS	Work Breakdown Structure

Appendix F: References

Acquisition Review, "Specification, Harmonization and Linkage of Test Parameters." Fall 1996.

AFGS-87253, Air Force Guide Specification, System Specification

AMC-P 715-17, Guide for the Preparation and Use of Performance Specifications

CJCSI 3170.01, Requirements Generation System, 13 June 1997

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DoD 4120.3-M, Defense Standardization Program (DSP) Policies And Procedures, July 1993

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General Services Administration Federal Standardization Manual, 1994

MIL-HDBK-245, Handbook for Preparation of Statement of Work (SOW), April 3, 1996

MIL-STD 498, Software Development and Documentation, December 5, 1994

MIL-STD-961, Defense Specification Practices, 22 March 1995

MIL-STD-962, Defense Standards and Handbooks, 20 October 1995

SD-2, Buying Commercial and Nondevelopmental Items: A Handbook, April 1996

SD-5, Market Research, July 1997

SD-15, Performance Specification Guide, June 29, 1995

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